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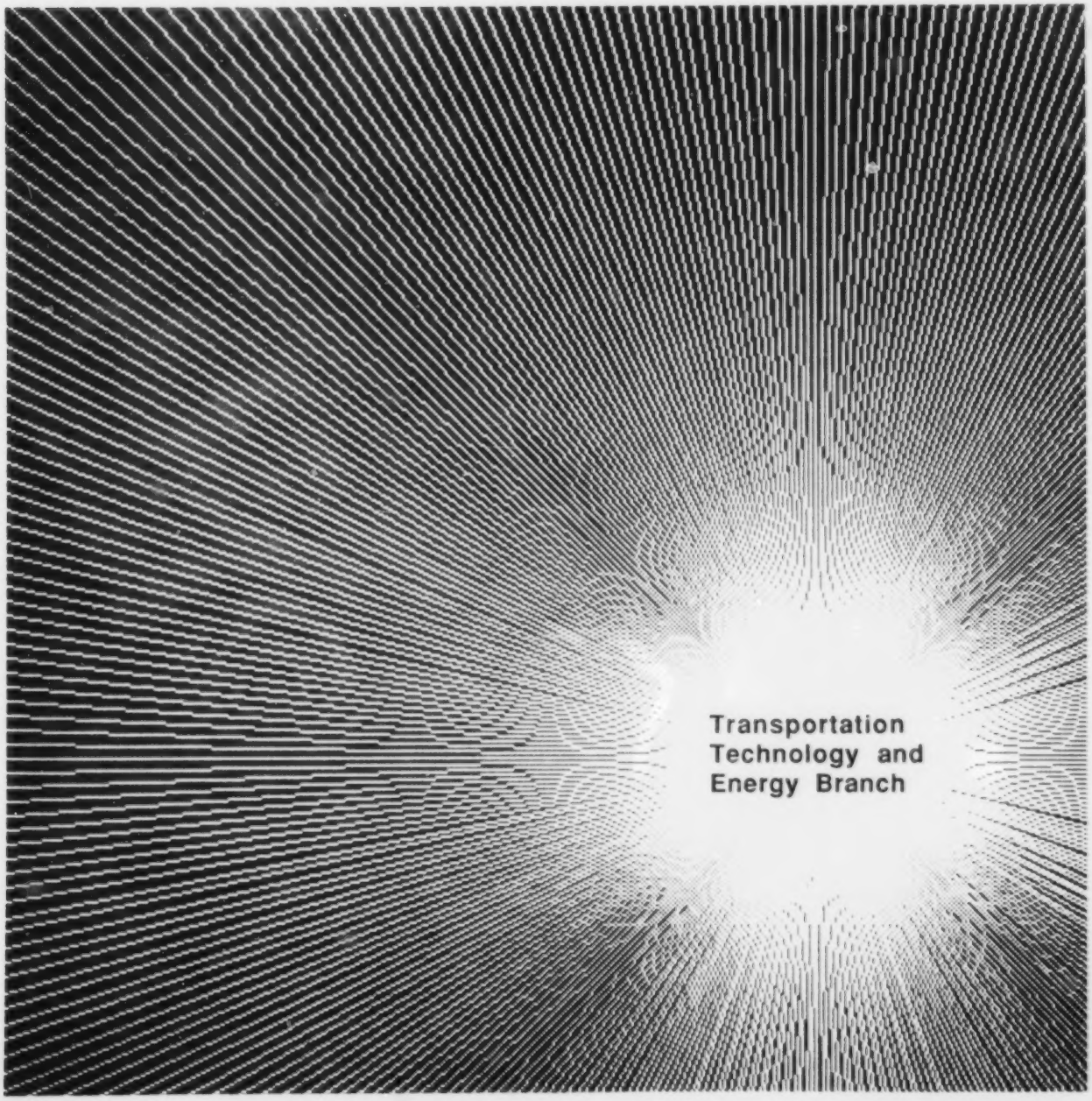

Ottawa Accessible Taxi Demonstration Project

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Ottawa Accessible Taxi Demonstration Project

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Abstract: The Ontario Ministry of Transportation and Transport Canada jointly funded a demonstration of accessible taxis operating as part of the regularly dispatched taxi fleet in Ottawa. Abt Associates was retained to conduct an evaluation of the program in terms of the economic viability of the service, the viability of the vehicle, community acceptance and driver training.

The demonstration consisted of four accessible taxis, two using a raised-roof design and two lowered-floor vehicles, that were purchased in 1988 by Transport Canada and operated by two taxi companies as part of the dispatched fleet in Ottawa. While the lowered-floor design was the preferred configuration, both designs used in the trial require substantial improvements before they will offer functionality and reliability comparable to a conventional taxi.

The demonstration indicates that accessible taxis substantially improve access to the community for persons with disabilities and that a significant market exists for accessible taxi service in Ottawa. Non-disabled passengers also responded very favourably to the accessible service.

Under present conditions of vehicle cost and available subsidy, vehicle owners face substantially lower returns from an accessible taxi in regular dispatched service as compared to a conventional taxi. On this basis, it appears that accessible taxis will not achieve the penetration in the taxi fleet that is justified by the potential market. Policy options should be examined that would stimulate operators to substantially expand the number of accessible taxis in service. Such policies would make a major contribution toward achieving the goal of universal access to the community.

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16. Abstract

The Ontario Ministry of Transportation and Transport Canada jointly funded a demonstration of accessible taxis operating as part of the regularly dispatched taxi fleet in Ottawa. Abt Associates was retained to conduct an evaluation of the program in terms of the economic viability of the service, the viability of the vehicle, community acceptance and driver training.

The demonstration consisted of four accessible taxis, two using a raised-roof design and two lowered-floor vehicles, that were purchased in 1988 by Transport Canada and operated by two taxi companies as part of the dispatched fleet in Ottawa. While the lowered-floor design was the preferred configuration, both designs used in the trial require substantial improvements before they will offer functionality and reliability comparable to a conventional taxi.

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Le ministère des Transports de l'Ontario et Transports Canada ont financé conjointement une campagne de démonstration de taxis accessibles intégrés dans un parc de taxis desservant la ville d'Ottawa. Abt Associates of Canada a reçu le mandat d'évaluer les résultats de cette campagne, des points de vue technico-économique, réaction des passagers et formation des chauffeurs.

Les quatre taxis accessibles mis en service, deux à pavillon surélevé et deux à plancher surbaissé, avaient été achetés en 1988 par Transports Canada et exploités par deux entreprises de taxis d'Ottawa à l'intérieur de leur exploitation normale. La version à plancher surbaissé a eu la faveur générale, mais tant celle-ci que l'autre à pavillon surélevé ont dû être profondément modifiées pour obtenir la disponibilité et la fiabilité des taxis classiques.

La démonstration a montré que les taxis accessibles éliminent les barrières entre la population handicapée et la collectivité et que la ville d'Ottawa constitue un débouché intéressant pour ce type de service. Quant aux personnes non handicapées, leur accueil a également été très favorable.

Dans les conditions actuelles du marché, les entreprises tirent de l'exploitation de taxis accessibles en service régulier un revenu nettement inférieur à celui des taxis classiques, même lorsqu'on tient compte des subventions auxquelles elles ont droit. Dans ces conditions, il semble improbable que le nombre des taxis accessibles puisse atteindre le niveau qui correspond au marché en puissance. Il y aurait lieu donc d'étudier des mesures de nature à encourager les entreprises à convertir un plus grand nombre de taxis accessibles, si l'on veut réaliser l'objectif visé qui est d'intégrer davantage la population handicapée à l'ensemble de la population.

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D/ Test Rider Diary
E/ Self-completed Questionnaire
F/ Driver's Log

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Peter Szirtes, A-1 Taxi

EXECUTIVE SUMMARY

The Ontario Ministry of Transportation and the Transportation Development Centre of Transport Canada jointly funded a demonstration of accessible taxis operating as part of the regularly despatched taxi fleet in Ottawa. Abt Associates was retained to conduct an evaluation of the program in terms of the economic viability of the service, the viability of the vehicle, community acceptance and driver training.

Since the vehicles were operated entirely on despatched and pre-booked calls, they had no access to the market for contracted services which may provide a significant share of income to the small number of accessible taxis operating elsewhere. Therefore the demonstration examines the operation of accessible taxi operation under the most stringent conditions -- use of accessible taxis as part of a regularly despatched fleet serving both disabled and non-disabled passengers. In effect, the trial simulates the economic and market conditions that would occur if accessible vehicles accounted for a significant portion of the taxi fleet. Since the demonstration was restricted to one community, care should be exercised when considering generalizations beyond Ottawa.

The demonstration indicates that accessible taxis substantially improve access to the community for persons with disabilities and that a significant market exists for accessible taxi service in Ottawa. Non-disabled passengers also responded very favourably to the accessible service. A preliminary estimate based on the results of the demonstration suggests that a fleet of 50 accessible vehicles (about 5% of the dispatched fleet) would be required to satisfy the market indicated by the results of the trial. This number should be more than sufficient to provide response times for disabled passengers comparable to the level of service provided to non-disabled passengers using conventional taxis. With time, this market should expand substantially, following the trend demonstrated by para-transit operations.

The demonstration indicates that the accessible vehicles used in Ottawa are not appropriate for long-term taxi service. The demonstration consisted of four accessible taxis, two using a raised-roof design and two lowered-floor vehicles, that were purchased in 1988 by

Transport Canada and operated by two taxi companies as part of the dispatched fleet in Ottawa. The operations reported in this study fell in the period from June 1989 to July 1990. While the lowered-floor design was the preferred configuration, both designs used in the trial require substantial improvements before they will offer functionality and reliability comparable to a conventional taxi. However, these conclusions might not be sustained by a similar trial using vehicles currently available.

Recruiting and retaining drivers proved difficult. Experienced taxi drivers were recruited to operate the demonstration taxis. They were trained to assist disabled passengers to enter and exit the vehicle, and after an initial learning period, performed satisfactorily. However, both operators experienced difficulty recruiting drivers and both experienced heavy turnover among drivers. Overall, drivers perceive an income deficit from driving the accessible vehicles. However the analysis suggests that less tangible benefits offset the time spent assisting disabled passengers and driver incomes are comparable to incomes earned by drivers of conventional taxis. Policy options should be examined that will help attract and retain drivers and ensure that all drivers complete an appropriate training program.

Under present conditions of vehicle cost and available subsidy, vehicle owners face substantially lower returns from an accessible taxi in regular dispatched service as compared to a conventional taxi. On this basis, it appears that accessible taxis will not achieve the penetration in the taxi fleet that is justified by the potential market. Policy options should be examined that would stimulate operators to substantially expand the number of accessible taxis in service. Such policies would make a major contribution toward achieving the goal of universal access to the community.

Sommaire

Le ministère des Transports de l'Ontario et le Centre de développement des transports ont financé conjointement une campagne de démonstration de taxis accessibles intégrés dans un parc de taxis desservant la ville d'Ottawa. Abt Associates of Canada a reçu le mandat d'évaluer les résultats de cette campagne, des points de vue technico-économique, réaction des passagers et formation des chauffeurs.

Comme ces taxis assuraient exclusivement des déplacements sur appel ou sur réservation, et nullement des services contractuels réguliers qui pourraient constituer une part importante des recettes dans une localité ayant un nombre peu élevé de taxis accessibles en service, l'examen de la rentabilité de cette campagne s'est fait par rapport au critère le plus rigoureux qui soit : l'exploitation à l'intérieur d'un parc de taxis classiques servant à la fois les clients handicapés et non handicapés. En réalité, la campagne a simulé le contexte technico-économique d'une exploitation où des taxis accessibles occuperaient une part significative à l'intérieur d'un parc de taxis classiques. Autre fait, comme la campagne a eu pour cadre la seule ville d'Ottawa, il y aurait lieu de ne pas généraliser les résultats obtenus sans tenir compte de cette réserve.

La démonstration a montré que les taxis accessibles éliminent les barrières entre la population handicapée et la collectivité et que la ville d'Ottawa constitue un débouché intéressant pour ce type de service. Quant aux personnes non handicapées, leur accueil a également été très favorable. Une analyse préliminaire des résultats de la campagne montre que, pour répondre à la demande en services de taxis adaptés, il faudra un parc de quelque 50 taxis accessibles (près de 5 p. 100 du parc total), chiffre plus que suffisant pour fournir aux clients à mobilité réduite ou handicapés un service d'une qualité comparable aux taxis classiques. Avec le temps, ce marché devrait connaître une croissance intéressante, comme celle qu'ont connue les services de transport adapté.

Il est apparu également que le matériel utilisé pour la campagne à Ottawa n'était pas approprié à un usage à long terme. Les quatre taxis accessibles mis en service pour les fins de cette campagne, deux à pavillon surélevé et deux à plancher surbaissé, avaient été achetés en 1988 par Transports Canada et exploités par deux entreprises de taxis d'Ottawa à l'intérieur de leur exploitation normale. Les résultats dont il est rendu compte ici vont de

juin 1989 à juillet 1990. La version à plancher surbaissé a eu la faveur générale, mais tant celle-ci que l'autre à pavillon surélevé ont dû être profondément modifiées pour obtenir la disponibilité et la fiabilité des taxis classiques. Mais, avec un matériel plus moderne, les résultats d'une campagne comparable auraient été bien meilleurs.

Le recrutement et la formation des chauffeurs de taxis n'ont pas été sans difficultés. Les chauffeurs de taxis recrutés, tous chevronnés, ont reçu une formation qui leur a permis, après une période de rodage, de se familiariser avec leur métier de chauffeurs de taxis aménagés pour le transport des personnes handicapées. Mais le recrutement a été laborieux pour les deux entreprises qui ont connu aussi un taux de mutation très élevé parmi les chauffeurs. Dans l'ensemble, les chauffeurs concluent à une baisse de leur revenu en service adapté. Par contre, l'analyse des résultats a montré qu'il existe certains avantages indirects qui compensent pour le temps passé à s'occuper des personnes handicapées et, au bout du compte, leur revenu est comparable à celui que retirent les chauffeurs de taxis classiques. Des tactiques sont proposées en vue d'aider les entreprises à recruter et à « fidéliser » les chauffeurs, une fois qu'ils auront achevé leur formation.

Dans les conditions actuelles du marché, les entreprises tirent de l'exploitation de taxis accessibles en service régulier un revenu nettement inférieur à celui des taxis classiques, même lorsqu'on tient compte des subventions auxquelles elles ont droit. Dans ces conditions, il semble improbable que le nombre des taxis accessibles puisse atteindre le niveau qui correspond au marché en puissance. Il y aurait lieu donc d'étudier des mesures de nature à encourager les entreprises à convertir un plus grand nombre de taxis accessibles, si l'on veut réaliser l'objectif visé qui est d'intégrer davantage la population handicapée à l'ensemble de la population.

Une sommaire en francais des chapitres 1 et 2 apparait aux pages 171 à 195.

1/ INTRODUCTION

1.1/ Background

The issue of access to the community for disabled persons has been a matter of policy interest to the federal and provincial governments for several years. Specific programs focus on employment, removal of physical barriers and accessible transportation. Advocates call for arrangements that reduce costs to the disabled and provide universal accessibility. Governments have recognized the potential for improved access that would be provided if taxi service should become accessible to all.

In October, 1987, Transport Canada and the Ontario Ministry of Transportation issued Terms of Reference for a joint accessible taxi feasibility/demonstration project to demonstrate from a business standpoint, the feasibility of accessible taxis operating to and from the Ottawa airport. Later, the focus was shifted to providing service across Ottawa as an integral part of the taxi fleet serving the population at large, including disabled and non-disabled passengers. The evaluation was to focus mostly on market-related indicators; service quality, operational performance and profitability. Success was to be measured according to acceptance by the taxi industry of the demonstration as a viable business venture, acceptance by disabled and non-disabled customers; and ultimately, by the introduction of an accessible taxi service independent of the program.

The decision to proceed was delayed until October, 1988, when the Ministry indicated its intention to proceed with Phase I of the project, the study definition of the Ottawa Accessible Taxi Demonstration Project. The study definition was completed by February, 1989, at which point the Ministry decided to proceed with Phase II, the demonstration project.

In 1988, Transport Canada procured a total of four specially modified minivans. Two vehicles were purchased from Air Surrey (referred to as raised-roof vehicles) and two from Care Concepts (referred to as lowered-floor vehicles). These vehicles were leased to Ottawa's Blue Line Taxi, the company that was to operate the vehicles over the period of

the demonstration. The vehicles were subsequently operated by two taxi companies. Blue Line operated the lower-floor vehicles during the course of the demonstration. A-1 Taxi was contracted to operate the raised-roof vehicles, starting on October 20, 1989. Figure 1 shows the raised-roof vehicle while Figures 2 shows the lowered-floor vehicle.

From the outset, it was recognized that the demonstration would operate on a very small scale, offering four accessible vehicles among Ottawa's total taxi fleet of over 1,000 vehicles.

The Ontario Ministry of Transportation and the Transportation Development Centre of Transport Canada jointly funded the operation of the demonstration and the evaluation of the project. Abt Associates of Canada was contracted to conduct the study definition of the demonstration project and, ultimately, to evaluate the demonstration project. The demonstration and this study were carried out under the guidance of a Steering Committee made up of representatives from the Ontario Ministry of Transportation, Transport Canada and the Transportation Development Centre. It should be clear that the demonstration is not a component of Ontario's Accessible Taxi Program. The demonstration and this study were undertaken as a research initiative to investigate vehicle technology and operational implications of accessible taxis serving disabled and non-disabled passengers within the dispatch system of a conventional taxi fleet. Since the trial was restricted to one community, some results may reflect characteristics of the market or the taxi industry in that community. Therefore care should be taken when considering generalizations of the results beyond Ottawa.

The start-up date for the demonstration was scheduled for April, 1989. It was delayed to allow necessary modifications to the vehicles, sufficient time to recruit drivers for the accessible taxis, and a preliminary trial period of use before the trial began. The demonstration was officially launched in May, 1989. The project was monitored over a 12-month period, once the demonstration had begun.

Figure 1/ Raised-Roof Vehicle

Figure 2/ Lowered-Floor Vehicle

1.2/ Demonstration Objectives and Design

In a change from the original terms of reference, the overall goal of the project was amended in October, 1988, to read as follows:

"The overall goal of this project is to demonstrate and evaluate the use and integration of accessible taxis for the transportation of the mobility handicapped in an Ottawa Taxi fleet, including general service and airport dispatches."

The specific objectives of the evaluation were stated as follows:

1/ "To measure the amount of time and mileage used by the test vehicles for the transportation of disabled riders and to express this value as a portion of the total time and mileage in service.

2/ "To evaluate the vehicle technology in use in the test.

3/ "To measure the acceptance and overall viability of the usage of such vehicles.

4/ "To study the financial ramifications associated with their usage.

5/ "To conduct an ergonometric evaluation of the vehicle.

6/ "To evaluate the training program used by the taxi firm and prepare training aids based on that program.

7/ "To prepare a draft specification for an accessible taxi from the information gleaned in this project.

8/ "To examine the operational considerations associated with the use of the vehicle."

A review of the stated objectives conducted as part of the Study Definition phase of Abt Associates' work indicated that some of the objectives were closely related. After some consideration and discussion with client representatives, Abt Associates assembled the objectives for the demonstration project into four general area of investigation that might be considered "sub-goals". They are:

1/ **Economic viability of the service** (Evaluation Objectives 1 and 4). As the Phase I report notes, answers to these questions were intended to rely to a large extent on the information derived from Blue Line's dispatch computer.

2/ **Viability of the vehicle** (Evaluation Objectives 2, 5, 7 and 8). After discussions with the Steering Committee, it was agreed that the work should not aim to draft a detailed engineering specification for accessible taxis. Rather, the Steering Committee was seeking comments and suggestions on the vehicles that could be incorporated in a future purchase specification. The suggestions would take the form of a checklist that would be incremental to existing vehicles, suggesting improvements or enhancements.

3/ **Community acceptance** (Evaluation Objective 3). An assessment of community acceptance required information from a variety of sources; principally, disabled and non-disabled riders of the accessible taxis.

4/ **Driver training** (Evaluation Objective 6). After discussions with Blue Line and the Steering Committee, it became apparent that Blue Line intended to build upon its experience in training drivers for its ParaTranspo service and to use the videotape produced by the Canadian Urban Transportation Association. It was therefore agreed that the role of the consultants would be restricted to providing support to Blue Line in the training exercise. Blue Line would have primary responsibility for training and would produce primary documentation of the training effort. The consultants would work with Blue Line to refine the training program and develop training routines that would enhance the program. Evaluation of the training package would draw upon the disabled test rider reports and the ergonomic review. The primary question to be addressed would be the extent to which the drivers exhibited the behaviors and techniques that were built into the training program.

The Phase I report presented Abt Associates' recommendations for a study definition for the accessible taxi demonstration in Ottawa. That report included a summary research plan and descriptions of each of the major elements of the demonstration and evaluation. Because it provided the structure for the research summarized in this report, the research plan is reproduced in Appendix A.

2/ SUMMARY AND CONCLUSIONS

2.1/ Introduction

2.1.1/ The Need for Accessible Transportation

The last two decades have been marked by rapid expansion of community-based services for disabled Canadians. Consumer advocates and government policy-makers agree that the concept of "independent living" should guide the relationship between disabled Canadians and the community at large. Central to the concept of independent living is access to the community. Disabled Canadians cannot live independently in the community or achieve their potential unless the environment is physically accessible. In Canada, many disabled persons lack the accessible and usable transportation that is the key to independent living.

Many communities provide para-transit service using accessible buses or vans for those who cannot use the conventional public transportation system. However these services fall short of the objective of universal accessibility to the community. The disabled community seeks a generally available accessible transportation system throughout Canada. Governments are supporting this in the design of new facilities.

The need for accessible transportation is growing each year. As disabled Canadians move from an institutional to a community-based setting, and as the population ages, an increasing percentage of Canadians require accessible transportation services to function satisfactorily in the community.

This study examines a promising policy option: an accessible taxi operated as an integral part of a conventional taxi fleet. This approach offers a readily-available transportation service that provides universal accessibility. To achieve the penetration in the taxi fleet that will be required to serve the potential market, the accessible taxi must meet a number of stringent conditions. It must offer service that is readily acceptable to both disabled and non-disabled riders. The vehicle should exhibit reliability and operating costs equivalent to

a conventional taxi. Drivers and operators should earn returns comparable to the returns from a conventional taxi.

On this basis, the demonstration project considers the viability of accessible taxis integrated into the dispatched fleet and relying for their income on the fares earned from dispatched and pre-booked trips and from passengers picked up at street stands and flag-downs on the street. In particular, the study does not consider the potential earnings from contract services serving disabled clients. While this source of business may support the first few accessible taxis in a community, it is unlikely to sustain the size of fleet that will be required to serve the potential market for accessible services. If accessible taxis are to become sufficiently common that they offer the disabled passengers a standard of service and response time equivalent to that available from the conventional taxi fleet, they will have to rely on the sources of revenue traditionally available to the taxi industry. Therefore, this demonstration examines the operation of accessible taxis against the most stringent criteria, performance in all respects that is competitive with conventional taxis.

2.1.2/ The Need - Disabled Canadians and Accessible Taxis

Two national studies conducted by Statistics Canada, the Canadian Health and Disability Survey and the Health and Activity Limitations Survey, confirm that Canada's disabled population has a significant need for more and better accessible transportation services. The studies have produced two findings which are particularly important to this work:

1/ Those who have need of special transportation services are relatively heavy users of taxi services (averaging 3.1 trips per month) as compared to those who have no difficulty driving a private vehicle (1.4 trips per month) These data refer to conventional taxi service because accessible taxis are still a rarity.

2/ It may be assumed that because of the level of cost, taxi service would not be used extensively by those with low incomes. The opposite is true. Among Canadians with annual incomes between $5,000 and $10,000, taxi use is relatively heavy (about 1.9 trips per month) as compared to the general population (1.4 trips per month).

Therefore the expectation that the market potential among disabled consumers would be limited because of the fare involved in using an accessible taxi, is not substantiated by the research findings.

2.1.3/ Accessible Taxi Services in Ontario

The provision of accessible taxi services is a recent phenomenon in Ontario. The telephone survey conducted early in 1989 of six operators in Ontario, indicates that all vehicles operated by the companies have been purchased since 1988 with assistance from Ontario's Wheelchair Accessible Taxi Demonstration Program. Therefore, the survey results reflect the experience gained in the first few months of operation.

In general, these taxi services reported encountering a number of challenges to their economic viability including the amount of down time they experience with equipment breakdowns, the number of clients they are able to attract to the service (including contracts to provide publicly-subsidized accessible transportation services) and an often-reported need to supplement driver earnings because of the restricted earning capacity of drivers of accessible taxis as compared to conventional taxis. At the time of the survey, most operators felt that the service would be viable only if it secured contracts to provide subsidized accessible transportation (similar to Ottawa's ParaTranspo) to supplement earnings as an accessible taxi. Operations that had secured such contracts reported that the accessible vehicles were still earning less than conventional taxis.

As noted, these results reflect only the first few months experience with the vehicles. More recent information indicates that as of September 1990, 23 operators across Ontario had purchased a total of 52 vehicles and were offering accessible taxi service in 29 municipalities. Thus the program, while achieving noteworthy success in introducing accessible taxis into service in Ontario, has not established the share of the taxi fleet in a community that would fulfill the concepts tested in this demonstration.

2.2/ The Vehicle

Transport Canada acquired the four demonstration vehicles and delivered them to Blue Line Taxi for preparation for use in the trial. Blue Line's initial assessment of the four demonstration vehicles identified a number of problems with both types of vehicle that in the company's view, had to be addressed before the vehicles were put in service. Transport Canada arranged for the necessary modifications.

An ergonomic assessment examined the design and operation of both types of vehicles. The study included video-taping the tasks of drivers assisting clients with various disabilities who use a variety of assists. The study identified a number of design faults, primarily related to ramp use in the raised-roof vehicle and tie-down provisions and procedures, where obvious and suitable tie-down points could not be readily identified on a scooter or wheelchair. It also noted a weakness or absence of driver training that led to improper procedures when assisting passengers and tying down wheelchairs or scooters. The assessment recommended 20 desirable characteristics of accessible taxi, considering the ramp, restraints and securements, interior design and general features.

Drivers are particularly critical of the raised-roof design. They find the vehicle unattractive and believe that because of its unusual appearance, it is less likely to be recognized as a taxi by those who want to hail a taxi on the street.

Passengers in the two types of vehicles were asked to rate vehicle characteristics. These results should be treated with some caution because the ratings may be susceptible to influence from the driver. The data suggest that the raised-roof vehicle is preferred by non-disabled passengers in terms of its seating arrangements, smoothness of ride and overall comfort. However, disabled passengers prefer the raised-roof vehicle only in terms of its smooth ride. Considering the lowered-floor vehicle, non-disabled passengers did not express a preference for this vehicle in terms of any characteristic. However, disabled passengers give higher ratings to the lowered-floor vehicle in terms of wheelchair location during the trip, security of wheelchair/scooter tie-downs and steepness and slope of the ramp.

Driver reports indicate that one vehicle of each design suffered numerous problems and major repairs that led to significant interruptions in service during the demonstration period, the first year of operation of the vehicles. An examination of Blue Line's maintenance records indicates that the two lowered-floor vehicles experienced routine non-warranty maintenance costs that were equal to or lower than the costs for a number of relatively new conventional taxis that were used as comparison vehicles. The maintenance records of A-1 Taxi were not sufficiently complete to allow an analysis of the costs of the raised-roof vehicles.

In the view of company officials and drivers, neither vehicle represents a viable long-term solution to the need for an accessible taxi. They believe that the basic platform, a Chrysler van, is not sufficiently robust for a taxi service; and the standard of design, workmanship and rust protection in the conversion suggests that the vehicle will have a short useful life in taxi service.

Disabled consumers, drivers, taxi company officials and the evidence of the ergonomic assessment all indicate that the lowered-floor design is superior to the raised-roof vehicle. However, the execution of the design in the vehicles used in the demonstration still leaves much to be desired in terms of its ride and accommodation for non-disabled passengers. In stating this conclusion, it should be remembered that the vehicles are examples of two conversions that could be purchased in 1988 and represent the standard available in the marketplace at that time. Other vehicles currently offered might be judged more favourably in a similar test, and the generalizations between lowered-floor and raised-roof designs may not necessarily apply.

Clearly, the availability of a vehicle which meets the expectations of consumers and of taxi operators, is crucial to the success of a program which aims to make substantial inroads into the taxi industry. Based on the evidence of this study, such a vehicle was not available in the Canadian marketplace in 1988.

2.3/ Drivers of the Accessible Vehicles

Both companies had difficulties recruiting and retaining drivers to operate the accessible vehicles. As a novel service using unconventional vehicles, the demonstration required additional work on the part of the driver. At no point in the demonstration was either company able to select from among candidate recruits. Finding replacement drivers proved as difficult as recruiting the original drivers. Generally, volunteers to drive the demonstration vehicles tend to be more mature drivers, many of whom have a disabled person in their family.

Driver training was carried out by Blue Line with assistance from the Ottawa Rehabilitation Centre. A review of the training shows that it covered the essential tasks of assisting disabled passengers and was as well designed and as effective as any available elsewhere. This training could quite easily provide the basis for training elsewhere in Canada for experienced taxi drivers who will operate accessible vehicles. However, the experience of the demonstration project illustrates the need for on-going reinforcement of training among qualified drivers. In addition, when replacement drivers began operating accessible vehicles, they were allowed to do so on the basis of cursory instructions from their predecessors. This approach is unsatisfactory. Only those drivers who have completed a satisfactory training course should be allowed to operate the accessible taxis and to assist disabled persons to enter and exit the vehicle.

During the demonstration, the drivers who were initially enthusiastic about the service became disillusioned. After one year, only one of the original drivers was still operating an accessible taxi. Some drivers transferred off the service for medical or health-related reasons. However, three principal reasons contributed to the departure of the remainder:

1/ The nature of the demonstration left drivers responsible for explaining the service, maintaining the drivers' log and promoting the service to the disabled community.

2/ The extra time required to assist disabled riders was, in the drivers' view, not compensated and represented a net loss of income.

3/ Drivers were dissatisfied with aspects of the operation of the vehicles including the issue of the drivers' liability, the look and ride of the vehicles (particularly the raised-

roof design) and long periods when two of the vehicles were out of service for maintenance.

A major share of the dissatisfaction of drivers with the accessible taxis relates to the short-term circumstance of the demonstration. As vehicle design improves and the vehicles become more reliable, another of the sources of dissatisfaction will be relieved. However, the experience gained in the demonstration confirms that close attention should be paid to recruiting and retaining drivers who are well suited to operating accessible vehicles. The tasks involved in assisting disabled passengers make demands on the driver that are seldom encountered in conventional taxi operations. A good deal of time and effort is invested both by the company in formal training and by the driver in learning to work with the vehicle and to accommodate and secure the wide variety of wheelchairs that exist in the community. Therefore, the accessible service will suffer substantial periods of inefficiency whenever a driver transfers off the vehicle and is replaced. Selecting and retaining appropriate drivers will be a key element of a successful accessible taxi operation.

2.4/ Passengers in the Accessible Taxis

The baseline survey of the disabled community in Ottawa developed a profile of potential use of the service and recruited test riders who would keep diaries of their trips including use of the accessible vehicles. Data from the baseline survey highlight the access to the community that is available to Ottawa's disabled population through ParaTranspo and other private arrangements. However, a substantial unmet need still exists. A principal finding of this component of the research is that about half of the trips taken by test riders in the accessible vehicles would not have been taken in the absence of those vehicles. The demonstration has confirmed that accessible taxis provide a substantial improvement in the access to the community for persons with disabilities.

Passenger responses show strong support for the service on the part of both non-disabled and disabled passengers. The vast majority of passengers would use the vehicle again and write-in comments show support for the concept and positive reactions to the taxi company for offering such a service. The few negative comments arose largely from a mis-

understanding of the intended use of the vehicle, serving both non-disabled and disabled customers. With improved publicity and more vehicles in service, this reaction should disappear.

Information provided by users confirms the improved access to the community that was anticipated in the baseline survey. One-third of wheelchair users and ambulatory disabled would not have made the trip if the accessible vehicle had not been available. Only 8% of non-disabled passengers fell into this category. Disabled passengers were less likely than non-disabled passengers to use the taxi for trips to work or for other personal business. They were more likely to use the service to go shopping or to go to medical facilities and leisure/recreation facilities.

2.5/ Economic Assessment

2.5.1/ Potential Market

An examination of the information derived from the baseline survey points to a substantial potential market for accessible taxis in Ottawa. Extrapolating the survey results to the population of Ottawa leads to an estimate that 900 disabled members of the community would definitely use this service and a further 2,100 would probably use it. A conservative interpretation of these results suggests a potential market of about 2,000 disabled consumers in Ottawa.

If Ottawa disabled consumers show about the same pattern of use as consumers across Canada, they will take just over three trips per month by taxi. An examination of the driver logs shows that during the demonstration, disabled passengers accounted for about 12% of all trips in the accessible vehicles. These data suggest that a fleet of about 50 accessible vehicles operating two shifts per day would be required to satisfy the initial demand for accessible taxis. However, other accessible transportation services such as ParaTranspo in Ottawa have experienced continually growing demand arising from a relatively stable base of disabled consumers. This experience suggests that the potential for accessible taxis in

Ottawa will grow well beyond the level suggested by data drawn largely from this demonstration project.

Some trips taken by disabled consumers would not be taken if the accessible taxis were not available. Therefore adding accessible taxis to the fleet will require that additional taxi licenses be issued to meet the new demand while maintaining the existing level of service to the community. Considering just these incremental trips, the demonstration suggests that initially the taxi fleet in Ottawa should be expanded by four additional vehicles to respond to the extra demand created by the availability of accessible taxis.

2.5.2/ Economics of Accessible Taxi Operation: The Driver's Point of View

While the voice-dispatch system used by A-1 left the impression with passengers that A-1 was more accommodating and probably serving a higher proportion of disabled passengers than was possible with the Blue Line computer-dispatch system, driver logs tell a different tale. Through pre-booking and non-dispatched calls, Blue Line drivers served disabled passengers on about 13% of all trips. Disabled passengers made up 12% of A-1 taxi trips. Overall, the four accessible vehicles averaged 12% of trips serving disabled passengers over the almost 5,000 trips reported during the period driver logs were maintained.

The ergonomic analysis and timing of tasks indicates that drivers spend about 6 1/2 minutes assisting passengers. Test rider diaries suggest that overall, drivers may spend close to 10 minutes, largely because drivers often assist passengers from their door, taking time beyond the tasks strictly associated with operating the vehicle. In summary, the research suggests that drivers may spend about 15 minutes per shift assisting passengers -- time that is not compensated and represents a potential reduction in earnings for the drivers.

However, the pattern of travel of disabled passengers may improve the revenue for the accessible taxis. The research shows that disabled passengers tend to take longer trips than non-disabled passengers. In addition, disabled passengers tend to travel at times when traffic congestion is low and when conventional taxis are less busy and therefore less

highly utilized. These two factors should tend to compensate drivers for the time spent assisting the disabled passenger to enter and exit the vehicle.

Nevertheless, one can anticipate that drivers will perceive a loss in earnings when serving disabled passengers. They will be conscious of the uncompensated time assisting passengers and they will be less aware of the offsetting effects of additional trips during off peak hours and the longer trips taken by disabled passengers because these factors are much less visible to the driver. Therefore, while the data suggest that drivers' earnings while serving disabled passengers should be about equal to the earnings serving non-disabled passengers, drivers may still perceive some deficit in income.

When serving non-disabled passengers, accessible taxi earnings should compare with the earnings of conventional taxis. The data from the drivers' log suggests that Blue Line (lowered-floor) accessible taxis acquire about the same proportion of fares from street stands as a comparison taxi. Since no data were available for A-1 comparison vehicles, the study cannot substantiate the drivers' claim that the raised-roof vehicle was substantially less successful than conventional taxis in picking up fares on the street. However, the experience of the demonstration suggests that vehicles that are less obviously modified -- the lowered-floor design -- will experience fewer difficulties in this area. While riders will eventually become accustomed to taxis of any design, the rate of acceptance will be faster for a design that is less obviously modified for accessibility. From the drivers' point of view, such a vehicle will present fewer risks of rejected fares or failure to flag down on the street and thereby give greater security to the driver's income.

In the long term, once accessible taxis become more usual in the taxi fleet, the operation of an accessible vehicle should yield returns to the driver that are about equal to those available to drivers of conventional taxis. However, drivers may still perceive a deficit arising from two sources: the design and general appearance of the vehicle that may be seen to limit the number of fares its driver will pick up on the street; and the uncompensated time that the drivers spend assisting disabled passengers.

The demonstration drives home a basic point: if accessible taxis are to be common in the dispatched fleet, drivers must be willing to be recruited and trained for this service. The

difficulty experienced by both companies in recruiting drivers and in high turnover among those drivers who were trained, illustrates the vulnerability of an unconventional taxi service to the interests and perceptions of taxi drivers. Yet if the near-term potential market for accessible taxis in Ottawa is to be served, about 100 drivers will be required. Clearly, if this goal is to be achieved, the interests and perceptions of drivers must be addressed.

2.5.3/ Economics of Accessible Taxi Operation: The Firm's Point of View

A firm that offers an accessible service may incur some additional costs in accommodating the dispatch requirements of those vehicles within the usual procedures. This problem appears to be more significant for firms such as Blue Line that use a computer-aided dispatch system. In this case, some additional capital or development cost may be involved in establishing the service.

The demonstration vehicles were purchased new and should incur relatively low maintenance costs. Maintenance records indicate this was the case. However, it appears that some interruptions in service occurred because of extensive warranty repairs on one lowered-floor vehicle and because of repairs arising from the modifications on one raised-roof vehicle. Therefore, the demonstration suggests that operators may experience some interruptions in service and reduced revenues from accessible vehicles because of a risk of lower reliability of the vehicle as compared to a conventional taxi. To some extent, this risk applies to drivers as well as to the company, although drivers may have an option to lease a substitute vehicle while an accessible taxi is out of service.

The demonstration illustrates that operating an accessible taxi service has the potential to yield a public image benefit to the firm. Non-disabled riders strongly support the service. This support may yield additional fares for the conventional taxis operated by the firms that integrates accessible taxis into their fleets.

From the point of view of the taxi operator, the principal impediment to offering an accessible taxi service is the capital cost of the vehicles. After the provincial capital subsidy, an accessible vehicle costs the taxi operator between $10,000 and $20,000 more

than a conventional taxi. Under the conditions of the demonstration, no additional income is available to the operator to provide a return on the incremental capital cost. On this basis, operators perceive little incentive to convert a substantial share of their fleets to accessible vehicles. Therefore, options should be examined that would provide an incentive to operators to expand accessible services, either by further defraying capital costs of the vehicles or facilitating access to other types of services that would expand the revenue potential for the accessible vehicles.

2.6/ Operational Experience

After preliminary trials of the two raised-roof vehicles, Blue Line opted to withdraw them from service. Transport Canada made alternative arrangements with A-1 Taxi to operate these vehicles as part of the demonstration. These arrangements provided a useful insight into two alternative modes of operation: Blue Line using a computer dispatch system that, because of its design, permitted little exceptional accommodation of the accessible taxis; and A-1 with a voice dispatch system, evidencing its strong desire to promote the accessible taxi service and to mount a successful demonstration. Therefore, the Blue Line dispatch can represent a base case of routine operation and A-1 a comparison case of extra effort to accommodate the accessible taxi service and to promote its use.

The Ottawa demonstration illustrates that if accessible vehicles are to operate as part of an integrated fleet, the dispatch system must be adapted to accommodate the accessible service. Call-takers and dispatchers should be trained to recognize the needs and expectation of disabled consumers.

During the demonstration, the availability of accessible vehicles was a continuing source of concern. With only four demonstration vehicles available among over 1,000 conventional taxis in Ottawa, the demonstration vehicles could respond to only a small fraction of the available calls. The Ottawa experience demonstrates that if an accessible service is to be widely used, the service must be generally available and reliable -- eliminating the possibility of stranding a disabled consumer with no means of accomplishing a return trip. In the view of the taxi operators, a minimum fleet to provide an acceptable standard of

service in Ottawa would involve at least 20 accessible vehicles in operation throughout the day on a two-shift basis (involving a total of 40 drivers). If an accessible service is offered with too few vehicles to provide reasonable response times, the frustrations evident during the demonstration among users and operators will continue and the service will fail to achieve its potential.

2.7/ Policy Implications

This study has examined the use of accessible vehicles as part of the regularly dispatched taxi fleet. The vehicles operate on the assumption that they will serve non-disabled passengers for the majority of fares and will provide comparable service to disabled passengers on request. The demonstration has shown that such a service is highly desirable because of the extent of improved access to the community that it would bring to persons with disabilities. Therefore, while the demonstration did not contemplate exploring potential policy implications, this section suggests some lines of development that follow from the experience gained in the demonstration.

2.7.1/ An Appropriate Vehicle

To provide such a service, an accessible vehicle must be available that is suitable for use in a taxi operation. It must provide reliability and operating costs comparable to a conventional taxi. The demonstration vehicles did not meet this standard. For the initiative to be successful, an appropriate accessible vehicle should be developed, either as a conversion of an existing van or wagon model, or as a special purpose vehicle.

2.7.2/ Driver Training and Retention

Assuming that an experienced taxi driver has the option of driving an accessible or a conventional taxi, the study suggests that there will be some entry costs when drivers move to an accessible taxi: additional training must be undertaken; and once operating an

accessible taxi, the driver will be initially less efficient in assisting disabled passengers. Once the initial learning period has been completed, drivers may still perceive a deficit in income because of the evident periods of uncompensated time to assist disabled passengers. Therefore, from the driver's point of view, two policy issues emerge:

1/ Start-up costs. Drivers will experience reduced incomes because of the requirements for training and the reduced efficiency experienced while learning to assist disabled passengers. Unless drivers are compensated for this time, they will be disinclined to make the transition to an accessible taxi.

2/ Required income. Even experienced drivers perceive reduced incomes because of the time to assist disabled passengers.

In addition, it should be recognized that driver earnings and the quality of service both benefit substantially if driver turnover is low. Therefore, policy options should be examined that would mandate training and defray the entry cost for drivers. While this study has not examined the implications of such policies, the general structure might follow these lines:

1/ Require that experienced taxi drivers who wish to drive an accessible taxi complete a satisfactory training course. Based on the experience of the demonstration, an adaptation of the training course used in Ottawa would appear satisfactory.

2/ Compensate experienced taxi drivers for the time required to complete the training course and defray the loss of income during the first weeks of operation of the accessible vehicle while gaining expertise in assisting disabled passengers.

3/ Require that only qualified drivers who have completed the training be allowed to operate the accessible vehicles. This requirement is important both for the safety of the disabled passenger and for acceptable conditions for the driver, from an occupational health and safety point of view.

4/ Recover the grant from the driver if the driver chooses to return to driving a conventional taxi within a stated period, perhaps two years. This might be arranged on a pro-rated basis, to encourage the driver to stick with the accessible taxi for an adequate trial period.

Such an approach would respond to a number of concerns that arose during the demonstration:

1/ All drivers must be properly trained in correct procedures when assisting a disabled passenger to minimize the risk to the passenger and to themselves. As well, drivers should be trained in correct tie-down procedures to avoid the risk of accident and/or injury to the passenger while travelling in the vehicle.

2/ An adequate trial period would ensure that drivers were committed to the service and had sufficient time on the vehicle to become accustomed to its requirements, to establish a working routine that takes advantage of the vehicle and the potential market, and to gain a clear picture of the actual earnings possible from the accessible vehicle. On this basis, the probability of returning to conventional taxi after a trial period should be relatively low.

3/ Drivers would be compensated for the learning time required to operate an accessible vehicle satisfactorily and would therefore have an incentive to make the transfer to the accessible service. This should reduce the recruiting difficulties that were experienced by both companies in the demonstration.

2.7.3/ Capital Cost

The primary barrier to more rapid penetration of accessible vehicles in taxi fleets arises from the economics of the firm. Even after existing subsidies, the accessible vehicles are substantially more expensive than new conventional taxis. The company is unlikely to recover the additional cost from drivers because the drivers will have no extra revenue from the accessible taxis and will be unwilling to bear extra costs. Yet the additional cost of the vehicle would imply an additional lease charge of between $10 to $20 a day, depending on the assumptions made in the calculation. In general, there appear to be two broad options:

1/ Increase the subsidy so the net cost of an accessible taxi is comparable to the cost of a new conventional taxi. The level of the subsidy might change as conversions become more numerous and the conversion process becomes more efficient.

2/ Use taxi licensing to create an incentive for operators to acquire accessible vehicles. In many municipalities the number of licenses is limited. Because of restrictions in the number of licenses issued, licenses have acquired significant trading value in some municipalities. One policy option would require an operator to convert a number of existing licenses to accessible taxis in order to be issued an additional license for an accessible taxi.

Such a licensing strategy could be difficult to put in place because of differences among municipalities. However, if such a process could be developed it would have a number of advantages. For example:

1/ The demonstration suggests that the net impact of expanded demand from disabled persons means that one in ten accessible vehicles required to serve Ottawa would be responding to new orders that arise from the existence of the accessible service. This offers a basis for issuing additional licenses. However, in order to provide adequate service, existing licenses should be converted to ensure the accessible fleet would be of a reasonable size.

2/ The strategy of taxi companies to increase the number of licenses may create an incentive to provide accessible services, in effect substituting the potential trading value of a licence for a capital subsidy.

Exploring these options is beyond the scope of this demonstration study. However, they may offer low cost mechanisms to cause a rapid expansion of the accessible taxi services.

2.7.4/ Coordination with Existing Accessible Services

The existing capital investment in para-transit services may offer the basis for another policy option to stimulate the use of accessible taxis. Coordination of the two services may limit the demands for new capital investments in para-transit services while building the demand for and the returns to accessible taxis. For example, accessible taxis could supplement para-transit services in two ways:

1/ Use accessible taxis to respond to orders for accessible transportation at peak periods, thereby avoiding an expansion of the bus service to handle the short-term peaks that occur during the day.

2/ Run the para-transit service on a one-shift basis except for special circumstances. It appears that the capacity of an accessible bus is seldom utilized during off-peak hours. The passenger configuration of an accessible taxi appears better suited to the bookings served during these times.

To use the Ottawa example, if an accessible taxi were responding to a pre-booked order from ParaTranspo, it would appear reasonable for the passenger to pay the normal ParaTranspo fare and for the ParaTranspo operation to make up the difference to the meter fare for the trip. Such an approach could offer substantial savings for the pre-booked bus

operation by reducing the number of vehicles required and the hours of service. In the short term this should allow ParaTranspo to operate fewer buses off-peak and reduce operating costs; in the longer term, the capacity provided by accessible taxis could delay the need to purchase new vehicles for the ParaTranspo operation. The improved utilization of the accessible taxis that should result from these arrangements would create incremental revenue for the driver and/or the company and justify some or all of the extra capital costs of accessible taxis.

In effect, this option uses the returns from the trips made by the accessible taxi serving non-disabled passengers to bear a share of the capital cost of providing an accessible service to the community. The implications of such an arrangement should be explored to determine the extent of the cross-subsidy of accessible services by taxi passengers, to assess the benefit to the accessible taxi operation and the implications for the passengers and the operators of the accessible transit service.

3/ METHODS

3.1/ Introduction

This study utilized an array of research methods to gather information on the operation of the demonstration vehicles as part of the taxi fleets operated by A-1 and Blue Line Taxi in Ottawa. Since the study monitored operations over a period of one year, the research team engaged in a continuing series of conversations and interviews with the individuals involved in the demonstration. This chapter describes the more formal methods used in the study. This outline of the principal methods of data collection should provide background for the detailed discussion of results that follows.

3.2/ Survey of Accessible Taxi Operators in Ontario

As part of the monitoring work of Phase II of the demonstration, the research team conducted telephone interviews with six taxi operators in Ontario who had recently added accessible taxis to their fleets. These interviews were structured to gain insight into the style of service provided by these operators, as well as identify problems that had arisen in running an accessible taxi operation. The interviews were conducted early in the demonstration (during the first quarter of 1989) to provide background information to the project.

3.3/ Baseline Survey

Prior to the start of the demonstration project, the research team conducted a baseline survey to collect information on disabled persons in the Ottawa area to assess their transportation needs and experiences.

The Phase I report recommended that a baseline survey should generate results that would compare to national statistics and generalize to the population of Ottawa. Consequently, the

research team designed the baseline survey using a method similar to that utilized in Statistics Canada's Canada Health and Disability Survey (CHDS).

During Phase I of this study, the research team considered the possibility of establishing a sample frame of Blue Line passengers by collecting the names and addresses of passengers who telephoned the company to order a taxi. The dispatch routines used by Blue Line typically do not ask for passenger name or destination. The routines and workload in the dispatch area are such that gathering names and telephone numbers to support a survey of riders could not be done.

CHDS telephoned households at random, administered a set of "screening" questions to identify any members of the household who qualify as being disabled, and asked the disabled person to respond to the balance of the questionnaire. A similar approach was used to generate a random sample of disabled Ottawa residents for the baseline survey.

The survey was conducted with three sub-populations.

1/ Individuals (identified through random telephone calls to Ottawa area homes) who met the screening requirements; e.g., suffered from a long-term disability and had travelled within the past year.

2/ ParaTranspo riders who signed consent forms authorizing ParaTranspo to release their name and telephone number for purposes of the survey. (ParaTranspo placed consent forms on ParaTranspo buses on two occasions. The baseline study attempted to contact all persons who completed a form and completed 36 interviews from the individuals who gave their consent.)

3/ Individual referrals by the first two sub-groups of individuals who met the screening requirements and who might be willing to respond to the survey. (Only seven interviews were completed with names provided as referrals.)

The initial design estimated that about one-third of survey respondents would be identified from the random calls or the consent forms and the remainder through referrals from the direct contacts. As indicated above, only a small number of referrals were actually provided. Consequently, the random telephone survey was extended to complete the target number of 100 interviews. The final number of respondents totalled 144.

Appendix B shows the final version of the survey questionnaire. Note that the overall responses to each question are entered on the questionnaire in the appendix.

3.4/ Ergonomic Assessment

On January 15 and 16, 1990, Human Factors North carried out an ergonomic evaluation as part of the Ottawa Accessible Taxi Demonstration Project. A preliminary ergonomics evaluation had already been completed at a training session for the vehicle operators on April 28, 1989.

All of the vehicles involved in the demonstration were available for the ergonomic evaluation. Four drivers were present. The two drivers from Blue Line (lowered-floor version) had been with the demonstration since the beginning of the project and had participated in the original driver training session. The two drivers from A-1 (raised-roof version) were relatively new to the project. They were not involved in the original driver training session.

The vehicles were evaluated during daytime use. Seven physically disabled volunteers from the Ottawa area participated. Three individuals used standard manual or lightweight chairs; two used battery-powered wheelchairs (one of these was a scooter) and two used crutches. All of the participants tried both the raised-roof and lowered-floor vehicles. Two additional powered wheelchairs were tested at the Ottawa Rehabilitation Centre. The use of the vehicles by these volunteers and the drivers' activities assisting them were videotaped for subsequent analysis. The evaluation was carried out during winter weather conditions. The outdoor temperature was extremely cold and the streets and sidewalks were covered with snow and slush.

Appendix C shows the detailed time analysis for each volunteer. Summary data are presented in the discussion in Chapter 6.

3.5/ Test Rider Diaries

In response to a follow-up contact after the telephone survey, a panel of mobility-restricted members of the Ottawa community agreed to record for a one month period, their contacts with any transportation facilities. Because of the nature of the task and because they volunteered, the test riders may represent the more active segment of Ottawa's disabled community. However, there appears to be no other source of bias that could suggest diary data would fail to represent disabled persons in Ottawa. The diary provides a record of the events and personal reactions of participants to each trip, including information on the frequency of travel, mode, origin and destination, cost, comfort, convenience, access to the community, etc.

In total, 11 groups of riders were recruited with two riders in each group. Three riders were unable to complete the diary, leaving the study with monthly diaries for 19 disabled test riders. The researchers maintained contact with the test riders throughout the recording period. At the end of the field monitoring, members of the research team met with all test riders who were available to attend the meeting to review with them the result from the diary analysis and to get any further comments about the experiences of the test.

The form used in the trip diaries is shown in Appendix D. Detailed tables of responses have been provided in a separately bound volume of this report.

3.6/ Self-Complete Questionnaire

To supplement the data provided by test riders, the research design specified a questionnaire to be left in the vehicles for completion by riders in the accessible vehicles, both non-disabled and disabled. Drivers requested that passengers complete the questionnaire and either return them to the driver or mail them to the research team, using pre-addressed pre-paid envelopes supplied with the questionnaires. The questionnaire is reproduced as Appendix E.

While these questionnaires provided useful data, the rate of completion was disappointing. Drivers reported that some passengers refused to complete the questionnaires. During a discussion of the self-complete questionnaire, the A-1 drivers suggested that if the passenger was not willing to complete the questionnaire, the driver would complete it on their behalf and would faithfully report the data from the passenger. On this basis, driver-completed questionnaires were accepted during 1990, from the A-1 vehicles. However, subsequent examination identified a series of driver-completed instruments that show a rating of "10" out of "10" on all characteristics of the vehicle. An examination of questionnaires completed by passengers (different handwriting, styles of completion etc.) showed that no passenger-completed instruments rated a vehicle at 10 on every characteristic. Therefore, the analysis ignores the assessments of characteristics that report ratings of 10 for every characteristic. This procedure should allow the study to take maximum advantage of the data from the self-completion questionnaire.

The data show 82 completed questionnaires returned by Blue Line passengers and 68 from A-1 for a total of 150 completed questionnaires useable for all questions except rating of vehicle characteristics. The procedure outlined above yields 68 questionnaires useable for ratings of the Blue Line (lowered-floor) vehicles and 44 useable for the A-1 (raised-roof) vehicle. Details of returns by passenger characteristics are shown in Figure 3. The useable questionnaires covered a period from September 18, 1989 to June 2, 1990. Responses were slightly more frequent during the early months, averaging about one per day from October through December and dropping to one every three days for April, May and June. The low daily rate of questionnaire completions contrasts with the request of drivers to request completions from every passenger for a period of time.

Because of the method used to distribute the questionnaires, these results should not be taken as statistically representative of passengers using accessible taxis. For example, it appears that disabled passengers were more likely to be asked to complete questionnaires than non-disabled passengers. However, the responses from passengers appear to provide a fair indication of passenger data for non-disabled and disabled passenger, taken separately.

Figure 3/ Summary of Returns for the Self-Completed Questionnaire

Category of Response	Total	Non-Disabled	Disabled Wheelchair/ Scooter	Ambulatory
Blue Line Lowered-Floor Vehicles				
Responses	82	61	15	1
Less				
No Ratings	2	1	0	0
Disqualified	9	8	0	0
Status not Reported	3	0	0	0
Usable for Ratings of Vehicle Characteristics	68	52	15	1
A-1 Raised-Roof Vehicles				
Responses	68	36	30	2
Less				
No Ratings	2	1	0	1
Disqualified	22	17	5	0
Status not Reported	0	0	0	0
Usable for Ratings of Vehicle Characteristics	44	18	25	1
All Accessible Taxis				
Responses	150	97	45	3
Less				
No Ratings	4	2	0	1
Disqualified	31	25	5	0
Status not Reported	3	0	0	0
Usable for Ratings of Vehicle Characteristics	112	70	40	2

3.7/ Driver Logs

The Study Definition Report outlined a broadly based approach to the project goal to "assess the economic viability of an accessible taxi service integrated in a taxi fleet". The design anticipated that four vehicles would be operated by Blue Line and that the company's dispatch computer would record the number of trips for non-disabled and disabled riders including non-dispatched trips such as passengers picked up at taxi stands or the vehicle being flagged down on the street. As that report was being written, Blue Line was in the midst of modifying the dispatch program on the assumption that the "cheat switches" installed in all taxis dispatched by Blue Line, would be disabled. The "cheat switch" allowed the driver to disable the connection between the meter and the taxi's computer terminal, thereby signalling to the dispatch computer that the taxi was empty and ready to accept another fare. Since all drivers had installed these switches, no driver had an advantage in the queue for the next fare, but drivers were reluctant to disable the switch because of the possibility that some drivers would re-install the switch and gain an advantage. The situation was complicated by the recognition in the collective agreement between Blue Line and the drivers' union, of the cheat switch as a specified condition of work. With the switch disabled, the revised computer program would capture information on all trips including the fares from street stands or flag-downs. Should the computer-generated information not be available, the report allowed an alternative source of information from logs maintained by drivers.

As the demonstration began, a number of modifications and improvements to the programming of the Blue Line dispatch computer were being undertaken in addition to modifications of interest to this study. Because the modified program would constitute a change in working conditions, implementation of the change required the approval of the taxi driver union. The combination of delays in implementing and testing the programs and the union's action of withholding approval of a trial of the modified programming have both contributed to delay the availability of the modified dispatch programming beyond the time monitoring information was required for the demonstration. Therefore, the proposed approach for the economic assessment could not be carried out.

When the delays in implementing changes to the dispatch program became extended, the research team approached Blue Line and A-1 to arrange for driver logs to be installed in the accessible vehicles and a comparison group of conventional vehicles. Drivers of the accessible vehicles co-operated with some reluctance. Until late in the study, the company was unable to recruit any drivers of conventional taxis to complete the driver log. When it became apparent that drivers of conventional vehicles were not co-operating with the request to complete a log, the study offered a financial incentive to co-operating drivers. This step did not break through the level of resistance that had arisen to providing this information for the study. Finally, one Blue Line driver agreed to maintain a log for a conventional taxi during the month of May. Reluctance on the part of the drivers springs from at least three sources:

1/ Drivers, as independent businessmen, are not accustomed to sharing information about their activities, particularly information which would give indications of their total earnings and net income.

2/ Blue Line drivers were particularly sensitive because at the time the request was made, the company and the drivers' union were in the midst of negotiations.

3/ At the time the diaries were requested, the federal government had announced its intention to implement the General Sales Tax (GST) that would include all service operations such as taxis. The union is opposed to implementing the GST and on that basis, is particularly sensitive about providing information that would indicate the level of activity of individual drivers.

Nevertheless, the drivers of the accessible taxis provided reasonably complete driver logs for periods of time between December 1989 to June 1990. Reports range from 42 days (Blue Line #48) to 163 days (Blue Line #416). The drivers logs that were completed by Blue Line drivers reported a total of 2,880 trips, the majority (86%) reported by taxi number 416. A-1 vehicles reported a total of 2,048 trips, 75% of those reported by taxi number 50. The comparison vehicles reported a total 436 trips.

The layout of the drivers' log is shown in Appendix F. Tables summarizing the returns and tabulating results are contained in Volume 2 of this report.

Note that some summary data were extracted from management reports routinely produced by the Blue Line dispatch computer. Because of the limitations outlined above, these reports show only those trips processed by the dispatch system.

3.8/ Quarterly Driver Meetings

The study team met quarterly with the drivers of the demonstration vehicles to discuss their current experiences with the vehicles and the general practices of operating an accessible taxi as part of a fleet of conventional taxis. The quarterly meetings of drivers of the accessible taxis were conducted as a "focus group" in order to assess their reactions to the service and to get first-hand reports on the vehicles and the service provided from the point of view of the driver. A total of four meetings were held with the drivers.

The research design anticipated that these meetings would explore changes over time, as perceived by the drivers -- changes in the type of passengers carried, changes in passenger reactions to the service, changes in the economic viability of the service from the driver's point of view. Unfortunately, with the shifts in personnel, only one driver participated in the project long enough to have any history with the project.

4/ DISABLED CANADIANS AND ACCESSIBLE TAXI TRANSPORTATION - A NATIONAL PERSPECTIVE

4.1/ Demographics of Disabled Canadians

One of the problems that has plagued the field of needs assessment for disabled Canadians is the lack of consistency in definitions across studies. This has meant that the information gained on the needs of disabled persons has tended to be locale specific. With the development of the International Classification of Impairments, Disabilities and Handicaps, the World Health Organization (WHO) has provided a framework which will serve to standardize definitions.(1)

According to the schema developed by WHO, the concept of disability refers to "any restriction or lack ... of ability to perform an activity within the range considered normal for a human being". This is distinguished from the concept of impairment which refers to a medical condition that may lead to a disability; i.e., "any loss or abnormality of psychological, physiological, or anatomical structure or function". The concept of handicap, by comparison, refers to the problems that may arise as a consequence of being disabled. Disabled persons can be considered to be handicapped in instances where they encounter cultural, physical and/or social barriers which exclude them from mainstream society or prevent them from achieving their goals. It is not a condition of the person, but of the environment within which the individual functions.(1)

The Canadian Health and Disability Survey (CHDS) was the first attempt to collect comprehensive data on disabled persons in Canada utilizing the functional limitations definition adopted by WHO.(2) This survey was carried out in 1983-84 as part of the monthly Labour Force Survey. In 1986-87 a second survey, the Health and Activity Limitation Survey (HALS), was conducted by Statistics Canada as part of its ongoing commitment to build and maintain a national database on disability.(1)

According to HALS, there are an estimated 3.3 million disabled persons residing in households and health-related institutions in Canada (12.9% of the population). Of the

estimated 2.8 million disabled persons (aged 15 and over) residing in households, over 19% are classified as severely disabled, 35% are moderately disabled, and 46% are mildly disabled. (These rates are based on a severity scale developed using the responses to the Activities of Daily Living questions and the general screening questions.)

As might be expected, the incidence and severity of disability increases with age. Disabled represent 5.6% of Canadians aged 15-24 and 36.8% of Canadians aged 65 years and older (for persons residing in households). Among disabled persons aged 15 to 64 an estimated 15% are severely disabled. This increases, with seniors, to 27%. However, 8[illegible]% or about 2.5 million disabled persons (aged 15 and over) residing in households report that they frequently participate in activities outside of their home.

Among those reporting a disability, 40% of those who are of working age (15 to 64) reported being employed in the week preceding the 1986 Census. Of those, 53% indicate that they were limited in the kind or amount of work they could do. Of the estimated 985,985 disabled adults who were "not in the labour force" (i.e., not working and not looking for work), 69% report that they were completely prevented from working because of their disability.

From available data, it is clear that many persons with disabilities can compete successfully for jobs if accommodations are made for their particular disability. The literature describes a variety of barriers affecting the entry of disabled adults into the labour force, including misconceptions about their capabilities, staffing policies, gaps in support services for those who wish to work, low wages, and transportation to and accessibility of the work site. Governments everywhere are beginning to address the issue through employment equity and other initiatives.

4.2/ Importance of Taxi Transportation to Disabled Persons

4.2.1/ Need for Service

The last two decades have seen a rapid expansion of community-based services for disabled persons. The current philosophy is to support individuals so they can remain in their regions, communities and homes. This shift in focus has created demands for new and expanded services. In some cases, the demand for services has outstripped available resources. More significantly, the nature of consumer expectations has changed. There are new demands for initiatives that will assist disabled persons to live independently.

Fundamental to the concept of "independent living" is control over one's life. This includes managing one's affairs, participating in the day-to-day life of the community, fulfilling a range of social roles, and making decisions that lead to self-determination and minimize dependence on others. Without appropriate community and personal support services, independent living will remain a dream for many disabled persons. What disabled persons need most from the communities in which they live is accessibility. Housing disabled persons in the community cannot succeed unless the environment is physically accessible; e.g., it provides ready access to shops, recreation, transportation, work and educational opportunities. A study of accessible environments found that many disabled persons have limited access to the services in their community because of the lack of accessible and useable transportation, eligibility criteria, inappropriate location of transit stops, special charges for parallel transit services, irregular services and time delays, and poor cooperation between various transit services(3). Transportation is an essential bridge to the community, a key to independent living.

4.2.2/ Current Use of Transportation Services

While some services are available, substantial unmet needs remain for transportation of the disabled. In excess of 300,000 persons with disabilities report that they "infrequently" or "never" participate in activities outside their residence and about 920,000 would like to do

more. Inadequate transportation was cited by an estimated 86,800 as a reason that activity was limited.

According to Statistics Canada's Report of the Canadian Health and Disability Survey (CHDS), of the 2.4 million Canadians reporting a disability, an estimated 1.3 million have access to public transportation; only 59% of those who are able to leave their home. Of those who have access to public transport, an estimated 281,000 (21%) experience difficulties using the public transportation system available. Difficulties most frequently mentioned include, difficulty getting on and off the bus or streetcar (mentioned by 73% of those experiencing difficulty) and difficulty getting to the stop (mentioned by 51% of those experiencing difficulty).

Taxis are an important substitute for private automobiles and a much needed complement to urban mass transit systems. The use of taxi transportation by disabled persons is increasing. According to statistics from CHDS, a taxi service is available to 80% of disabled persons able to leave their homes. However the Transportation Information Base developed by TDC from CHDS and HALS data and findings from other studies indicates that only a small fraction of the disabled population make regular use of taxi service.(4) (Note that these results reflect use of conventional taxi services, not accessible services.)

1/ Less than 1% of the disabled population use taxi services, almost every day "all year" or "part year" (these categories are interpreted as over 30 trips per month).

2/ About 4% of the disabled population use taxi services frequently (about 10 trips per month).

3/ About 20% of the disabled population use taxi services occasionally (5 trips per month).

4/ The majority (76%) of the disabled never or seldom use taxi services.

These results have been extrapolated to the population of disabled Canadians, estimating that in total, persons with disabilities account for about 3.2 million taxi trips per month. About 2.2 million of these trips were taken by the transportation disabled in conventional taxi vehicles.

The CHDS data reflect national averages. Undoubtedly the relationships are somewhat different in Ottawa. However, applying the general relationships from the national data to Ottawa will yield at least an "order of magnitude" estimate of taxi use in Ottawa. While crude and not statistically accurate, such estimates may give a general appreciation of likely taxi use by Ottawa's disabled population. If these relationships are applied to Ottawa, the results suggest that the transportation disabled in Ottawa take about 46,800 taxi trips per month or about 1,560 trips per day. Therefore, the transportation disabled account for a significant share, perhaps in the order of 6% of Ottawa's total taxi service.

As discussed below, disabled Ottawa residents report that if an accessible taxi service were generally available, it would be used in preference to conventional taxis by some fraction of the transportation disabled. In addition, those who are unable to use conventional taxis or experience difficulties with them would extend the client base for accessible taxis operating within the taxi fleet.

The analysis derived from the CHDS and HALS data provides some additional insight into the use of conventional taxis by the disabled population. The results show that almost 28% of disabled females use taxis on average of about 1.8 times per month as compared to 19% of males who make use of the service on average 1.2 times per month.

It is generally assumed that, because of the relative expense of taxi services, individuals who are unemployed and those with low incomes will not make frequent use of taxis. The results show the opposite pattern. According to the CHDS data, individuals with incomes of $5,000 and $10,000 per year make more frequent use of taxis, averaging 1.9 trips per month per person(4). The CHDS data show that those who need special transportation use taxis more frequently than those who do not (3.1 trips per month compared to 1.4). Individuals who have difficulties using a private vehicle as a driver average about 2 trips per month in a taxi, almost double the rate of people with no difficulty driving a private vehicle (about 1.1 trips per month).

4.2.3/ Accessible Transportation Services

One solution many communities have adopted has been to develop special bus or van services for people who cannot utilize the conventional public transportation systems. There are two major problems with this approach:

1/ The service available is limited. Accordingly to HALS, of the 2.8 million Canadians (aged 15 and over, residing in households) reporting a disability, an estimated:

- 163,405 need special bus or service.
- 95,005 (58%) have access to such a service.

2/ Whatever other advantages the approach may have, special services segregate their users from the general public. In addition, they restrict the range of choices available to the user; generally the service has to be booked in advance. As a consequence, segregated services can be seen to limit the disabled person's ability to live independently in the community. They violate the spirit of independent living; namely, the principles of normalization and integration.

Private forms of transportation are similarly flawed.(3) Physical barriers associated with the inappropriate or inconsistent design of privately-owned or operated vehicles restrict their use by disabled persons. Also, the cost of retrofitting privately-owned or operated vehicles is prohibitive for many people.

Restrictions to mobility imposed by inadequate or inaccessible transportation services seriously affect the economic and social life of disabled persons. Since most problems confronting disabled persons are inter-related, the elimination of one barrier can be expected to have a ripple effect on others. As transportation becomes more accessible and useable, other areas of an individual's public and private life will be facilitated and the goal of independent living advanced.

4.3/ Future Service Requirements

Two major factors have the potential to affect the demand for services in the future:

1/ An aging population. The number of individuals aged 65 and over is increasing rapidly. By the year 2030, it is estimated that seniors will represent in excess of 20% of the population of Canada. While many seniors will have no difficulty using conventional transportation services, a growing number will require services that have been modified to accommodate disabilities they may acquire over time.

2/ The demand for independent living. The concept of independent living developed within a milieu of increased consciousness about the rights of disabled persons and the growth of community activity toward integration, equality and independence. What began as an initiative to secure new rights and entitlement -- to improve services for disabled persons -- has gradually evolved into a movement to empower disabled persons. The nature of consumer expectations has changed, resulting in new demands for initiatives that will assist disabled persons to live in the community independently. These demands can be expected to grow, not diminish, with the influx of the "baby boomers" into "golden age" status.

Recognizing the need to provide policy direction in this developing area, Transport Canada and the Ontario Ministry of Transportation have sponsored the Accessible Taxi Demonstration project. This project explores, in a limited but commercial setting, some of the issues surrounding initiatives to encourage the introduction of accessible taxis in Canada.

5/ THE OPERATOR

This chapter summarizes the findings of the interviews with operators of accessible taxi services in Ontario and provides background on the two operators involved in the Ottawa demonstration project, Blue Line Ltd. and A-1 Taxi.

5.1/ Past Experience with Accessible Taxis in Ontario

Early in Phase II, in the first quarter of 1989, the research team interviewed all companies that were operating accessible taxis in Ontario at that time. The interviews provided additional background information to the project. The following section summarizes the findings.

5.1.1/ The Acquisition of Accessible Vehicles

The acquisition of accessible vehicles was a relatively recent phenomenon for all of the operators contacted. All of the vehicles had been purchased within the last year. At the time of the survey, half of the operators had operated their accessible vehicles for only two to three months. The decision by operators to purchase vehicles and provide accessible service appears to respond to Ontario Ministry of Transportation's Wheelchair Accessible Taxi Demonstration Program, which provides a $5,000 subsidy to support the purchase of accessible taxis.

All of the operators were using modified or converted Dodge vans, with a raised roof and pull-out ramp. The majority of companies had added, or were in the process of adding, three accessible vehicles to their fleet. Two of the companies had limited themselves to a single vehicle. However, one of these operators was considering purchasing additional vehicles.

The majority of the vans had been converted in the United States but two companies were operating with vehicles modified by a company in Cambridge, Ontario. While the comparison group is small, and vehicles had been on the road for a relatively short period of time, this seems to have produced a more acceptable vehicle. Companies operating with the Canadian version were basically satisfied with the vehicle. They had experienced minor problems with the vans, but nothing major.

Operators using the American-modified version were less satisfied with the vehicle. Two of the operators using the American version expressed reservations about the longevity of the vehicle. These operators had also experienced the greatest amount of downtime from equipment malfunctions (including everything from a window that "blew out" to the replacement of 12 transmissions on a single vehicle and problems with a wheel that fell off when a component failed). There were major problems with the ramp, stemming from its design and construction which caused it to break under weight.

5.1.2/ Economic Viability of the Service

Three factors influenced the operators' perception of the economic viability of the service: the amount of downtime they experienced from equipment breakdowns; the number of clients they were able to attract (an issue that is closely related to the level of community interest in or acceptance for the service and their ability to pick up the overflow from para-transit services in the community); and driver earnings.

1/ **Equipment downtime.** Outside of recording major problems, none of the companies were keeping detailed maintenance records for the accessible vehicles. They had no plans to do anything in the way of of a formal evaluation and had little information on the cost of operating the accessible vehicles. In the main, operators estimated the cost of operating the accessible vehicles by averaging the cost of all their units. Not surprisingly, the companies that had experienced major difficulties with the equipment had serious reservations, not only with respect to the vehicle, but the economic feasibility of offering such a service.

2/ **Vehicle usage.** The pattern of usage varied widely. In all but one instance, the vehicles were dispatched like a conventional taxi. They were operated seven days a week. A few operators had restricted hours of use, generally, 8:00 a.m. to 5:00 p.m., but they remained "on call" and could be available within one-half to one hour.

Most operators were able to negotiate small contracts with different service organizations in their area. Some, but not all, were able to negotiate contracts with para-transit services to handle the overflow from their operations. This difference had a significant affect on how the operators viewed the service. One operator indicated that outside its contract work, which accounted for about 25% of the time in use, the vehicle was down about 60% of the day. In his view, the community had not accepted the vehicle. He was afraid to send it unsolicited to non-disabled passengers. Income from the vehicle was coming primarily from a handful of contracts with service organizations in the area and for service to "shut-ins", individuals on fixed incomes who used the service mainly for emergency situations. This operator had serious reservations about continuing the service beyond the school year.

Another operator noted that "when they're on the road, they're making money". He estimated the vehicles were averaging somewhere on the order of 10 calls per vehicle per shift for disabled passengers and 30 to 40 calls per vehicle per shift for non-disabled passengers. He was experiencing "no difficulty" dispatching the vehicle to non-disabled passengers, though drivers were experiencing some difficulty picking up non-disabled passengers in the van. The major problem for this operator was excessive vehicle downtime and an inability to negotiate a contract with the para-transit service in his area. Like the above noted operator, he was reduced to carrying disabled persons who used the service for emergency situations.

The operators who had been more successful in diversifying the use of the vehicle, had been able to negotiate contracts with companies providing para-transit services to their communities, were more positive about the service and the long-term economic viability of the project than those who had been unsuccessful in these attempts. Even so, all operators stated they were underwriting the cost of the service out of their conventional taxi service.

3/ **Driver earnings.** According to the operators, driver earnings were not significantly affected by the addition of the accessible vehicles. In the view of the operators, the drivers were earning at least the equivalent of drivers of conventional taxis. In those instances where the taxi earned less, the operators supplemented the driver's salary either through a cash adjustment or by directing additional trips to the accessible vehicles. In one instance, day drivers were paid a salary which they supplemented by working evenings or weekends. Night drivers, or drivers who worked evenings or weekends, were allowed to split the income from the vehicle 50:50. In all other instances, drivers were paid a commission based on a percentage of the gross income for the vehicle. The operators retained ownership of the car. They supplied the fuel, provided maintenance, insurance, etc. and took somewhere in the order of 60-65% of the income on the vehicle.

5.1.3/ Driver Selection and Training

Operators stressed the importance of recruiting drivers with the "right kind of attitude". The appropriate drivers of accessible taxis tend to be more experienced taxi drivers who know their way around the city and who get some satisfaction from helping people.

Most of the operators provided training for their drivers. In the majority of cases, the training was provided by para-transit equivalents or community colleges. In a couple of instances, the company provided the session.

5.1.4/ Community Acceptance

Some of the operators had been providing services, to at least a portion of the disabled community, for years. These operators were having little difficulty expanding their service or negotiating contracts with organizations serving disabled clients. They were generally positive about the service and saw the community as positive. Other operators, while they were less enthusiastic for the reasons discussed above, conceded that there was a potential demand for the service. In the view of these operators, the key lies in providing subsidies, similarly to that available to para-transit services. Without this type of subsidy, many disabled clients would, in their view, be unable to afford the cost of a taxi.

5.2/ Background of Blue Line Taxi Co. Ltd.

The Blue Line operation is made up of a number of components: vehicles under its control, including 55 para-vans, 4 Orion para-buses, para-transit cars, 5 limousines, and 80 standard taxis; and vehicles it dispatches for private fleet holders, such as Alpha or G N Taxi Limited. Some of these private companies may be affiliates of Blue Line's operation; others may not. For a time, Blue Line provided dispatch services for part of A-1's operation. Somewhere in the order of 650 to 700 taxis owned and operated by private fleet holders are dispatched by Blue Line.

Blue Line is the largest taxi operator in Ottawa. It handles about 65% of the taxi business in the city, made up of company dispatched rides, flag downs and business through the taxi stands.

Depending upon time of year, weather, etc., Blue Line dispatches may range from 8,000 to 20,000 calls per day. Added to this are street pick-ups by drivers and fares from the taxi stands that do not go through the dispatch system. Except for the small number of city stands, which are shared by everyone, the majority of taxi stands in Ottawa are under the control of Blue Line.

Blue Line has developed a computer-based system to dispatch its calls. Requests for taxis are received by one of seven call takers at Blue Line's dispatch centre. These requests are typed into a computer which dispatches the order to the first available vehicle in the area. There is no voice-dispatch, except in the case of emergencies. Blue Line staff and drivers are convinced of the merits of the system.

With a voice-dispatched system, there is a potential for dispatchers to direct additional orders, long trips and/or preferred customers, to a particular driver or vehicle. With a computerized system, it is difficult to engage in this type of favoritism. Drivers log into an area. As they come to the head of the queue for that area, they are offered an order which they can accept or reject.

There are no driver employees at Blue Line. In the main, drivers either rent a vehicle from Blue Line, for a stipulated amount - Blue Line owns the car and taxi plate - or they rent from some other operator and that taxi is dispatched through Blue Line. Under this arrangement, drivers use the income from the vehicle to pay for their expenses, and any balance of fares and tips become the drivers' earnings.

Blue Line drivers are protected by a collective agreement which specifies the conditions of work. The contract was negotiated during the course of the demonstration and has just been signed for the current year.

An important component of Blue Line's operation is its contract with OC Transpo for ParaTranspo services in Ottawa. As a result of this contract, Blue Line has formal experience beyond that which has arisen during the taxi business, transporting disabled riders and developing training packages for drivers.

5.3/ Background of A-1 Taxi

In comparison to Blue Line, A-1 Taxi is a small operation. It is a collection of companies. Cars are dispatched from two separate centres. The group operates in the East and Centre of Ottawa as "A-1". In the West, it operates as "West-Way Taxi". A-1 has a fleet of approximately 100 to 150 vehicles, with another 75 operating as West-Way Taxi. The company serves all Ottawa's municipalities except Gloucester.

Drivers at A-1 have similar arrangements to those available at Blue Line:

1/ A-1 owns the car and license plate; drivers rent the vehicle for an agreed-upon amount.

2/ A-1 owns the license plate; driver provides the car.

3/ Driver owns the license plate; A-1 provides dispatch services.

4/ A-1 provides dispatch services for other operators.

There are no driver employees. Drivers are unionized by the same union as Blue Line drivers.

A-1's business is made up largely of call-ins to the two dispatch centres and from flag-downs. Like other taxi operations, A-1 has access to the City taxi stands, but the majority of stands are controlled by Blue Line. A-1 uses a voice-dispatched system.

Prior to the demonstration project, A-1's experience was limited to transporting disabled riders who were able to use conventional taxis. A-1 had no experience training drivers to transport such passengers.

6/ THE VEHICLE

This chapter summarizes observations on the accessible vehicles stemming from a number of sources:

1/ The preliminary assessment conducted by Human Factors North on April 26, 1989, supplemented with the ergonomic evaluation conducted on January 15 and 16, 1990. The ergonomic evaluation provides two types of information: an ergonomic evaluation of passenger related vehicle design features and a detailed task analysis.

2/ The engineering review of the vehicles conducted under separate contract by TES Limited of Ottawa to examine problems identified with the raised-roof vehicles during the preliminary assessment.

3/ Operator observations of the vehicles, gathered through interviews and discussions with company representatives.

4/ Driver observations of the vehicles, as communicated through quarterly driver meetings.

5/ Passenger rating of both designs of accessible vehicles, based on responses to the self-completed questionnaire distributed to passengers in the demonstration vehicles.

6/ A review of maintenance costs from data available from Blue Line and A-1.

As discussed above, these vehicles are conversions based on the Dodge "Magic Wagon". The vehicles were delivered early in 1989 and reflect the state of development of vehicle design and accessibility modifications of the conversion companies at that time. It appears that at least some of the base vehicles were 1987 models because pre-1988 warranty conditions were applied to a claim for transmission repairs. Subsequent developments in the basic vehicles and/or the modifications may have responded to some issues raised in this discussion.

It should be noted that all accessible taxis must satisfy the requirements of the Canadian Standards Association's standard CAN3-D409-M84, Motor Vehicles for the Transportation of Physically Disabled Persons (usually referred to as D409) which has been adopted by Ontario as both a manufacturing and an in-service standard. D409 was incorporated into law through Ontario Regulation 167/81 of the Highway Traffic Act that addresses vehicles

designed and manufactured or converted after January 1, 1986 for transportation of disabled persons. Further, mandatory periodic safety inspections of such vehicles are required through Ontario Regulation 483.

6.1/ Ergonomic Assessment

As discussed in Chapter 3, both types of vehicles were withdrawn from service for two days so that an ergonomic assessment could be carried out. The assessment used seven disabled volunteers who employ a variety of aids. The vehicle operations were video-taped for subsequent analysis. The following sections summarizes the findings of the ergonomic evaluation.

6.1.1/ Passenger-Related Vehicle Design Features

6.1.1.1/ Ramp Features - Raised-Roof Vehicles

The access ramp in the raised-roof vehicle is stowed under the floor and deployed manually by the driver. The ramp can only be deployed on the right (non-driver) side of the vehicle, even though there is an entry door available on the left (driver's) side of the vehicle. The ramp restricts wheelchair passenger entry to one side of the vehicle. Passenger loading from either side of the vehicle would be preferable. Figure 4 shows the ramp location of the raised-roof vehicles.

The ramp is comprised of two sections: an inner section (which resides inside) and an outer section or shell (which is pulled out, e.g., telescoped) during deployment. In this way, the length of the ramp can be extended beyond the length of the stowage space. Both sections of the ramp have a tendency to stick during deployment and stowage even when the ramp is drawn straight out or pushed straight in. The sectional design also results in an uneven ramp surface. A properly designed non-skid flap could be added at the junction of the two sections to provide a smooth edge. Because the ramp tends to stick, drivers usually assist

Figure 4/ **Ramp Location of Raised-Roof Vehicles, showing ramp partially extended (usual operation) and fully extended**

passengers with the ramp partially extended, exacerbating the already steep ramp angle, particularly when the passenger is not boarding the vehicle from the sidewalk level.

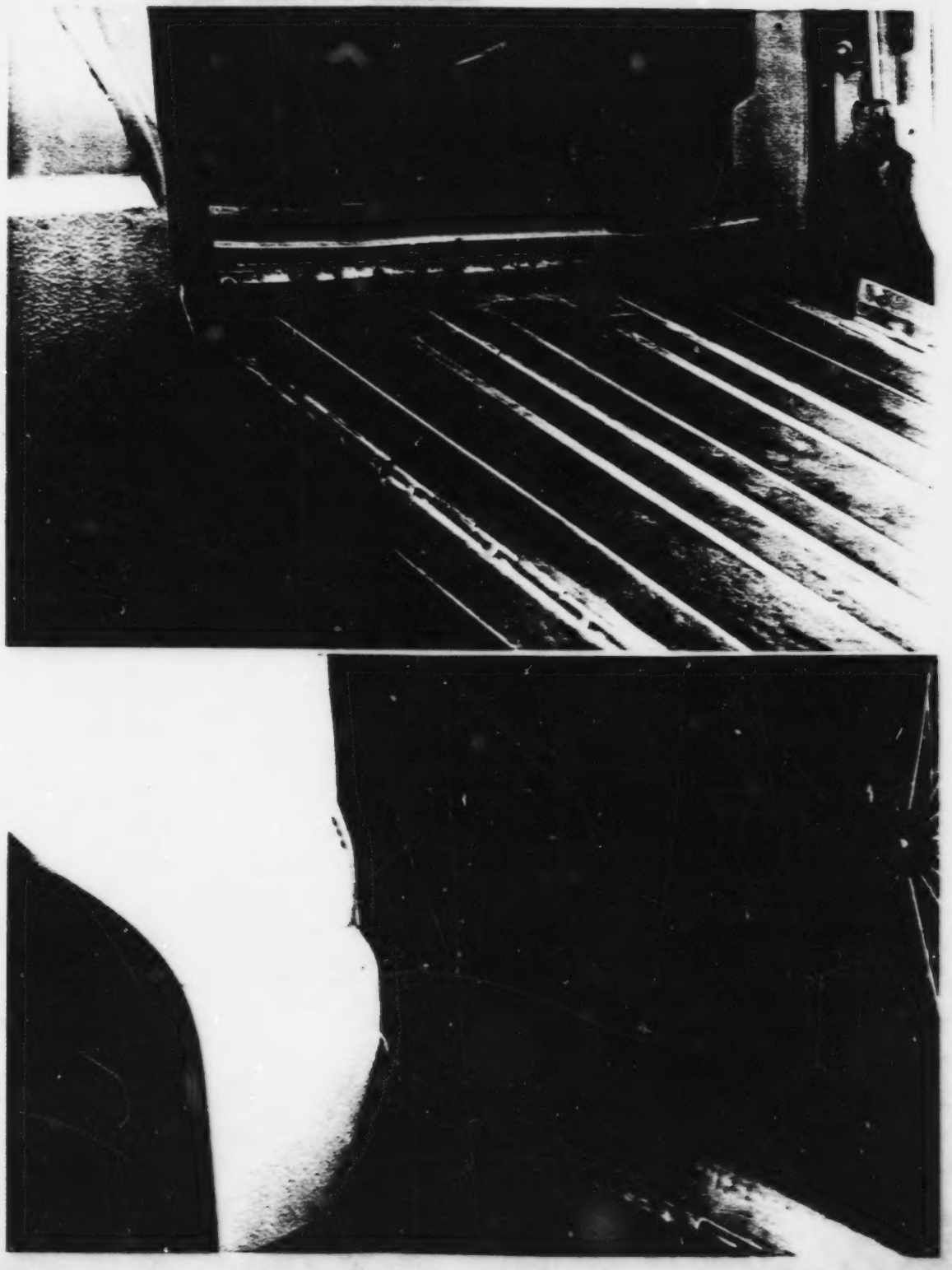
During cold weather operation, the ramp was observed to stick repeatedly. On one of the vehicles, the inner section could not be withdrawn fully from the outer shell. This prevented the use of the side guards on the inner shell of the ramp. These problems could be remedied by the addition of plastic tracks on both the outer and inner ramp sections.

The ramp stowage location is covered with a hinged metal flap which rests on the ramp when in use. The flap is a desirable design feature which insures a smooth surface connecting the ramp and the vehicle. However, the flap does not lie flat on the ramp in either vehicle. Further, the top edge of the flap is located about 1 cm below the level of the interior carpet. Both of these transition points cause problems for semi-ambulatory and wheelchair passengers. Figure 5 shows the hinged metal flap covering ramp storage area when deployed and the relative size of the transition and the front wheel of a wheelchair.

The ramp is made of aluminum and covered with strips of non-skid material (refer to Figures 4 and 5). During the course of the evaluation, drivers were observed to slip while loading passengers. Semi-ambulatory passengers expressed concern that their crutches might slip while boarding and exiting the vehicle. The entire surface should be fully covered with non-skid material.

At the time of the original training sessions, the ramp was deployed by means of two angle irons that projected above the ramp ends. These angle ends were singled out as a possible cause of passenger and/or driver injury in the preliminary report. The report recommended redesigning the system for ramp deployment to ensure that the ramp could be used without danger to passengers or drivers. The substitution of straps for the angle irons was the only substantial modification made to the raised-roof vehicles prior to the actual demonstration phase.

Figure 5/ Raised-Roof Vehicles: Hinged Metal Flap Covering Ramp Storage Area when Deployed, showing transition relative to front wheel of a wheelchair



Originally, the ends of the ramp had been painted to provide a high contrast visual edge. This is a good feature because it alerts both the passenger and the driver to the ramp ends. By the time of the winter evaluation, no trace of paint remained on either of the ramps in the raised-roof vehicles.

The end of the ramp is fitted with a tapered lip which is intended to improve the contact between the ramp and the ground. The lip does not make even contact with the ground and passengers' feet and wheelchairs tend to get caught at this point.

The edge of the step at the passenger entry door is painted yellow. This is a useful feature for semi-ambulatory passengers boarding without the ramp.

With the ramp fully deployed, the ramp angle relative to the ground is 15 degrees. (Ramp length is 186 cm. The floor of the vehicle is 47.5 cm above ground level.) The recommended angles for stationary ramps for the physically disabled are in the range of 7 to 10 degrees. Thus, the slope or grade of the ramp exceeds the recommended range. (A ramp length of approximately 270 cm would be required to obtain an angle of 10 degrees given the ground to floor height of this vehicle.) Figure 6 shows the ramp angle of the raised-roof vehicles.

The edges of the ramp are fitted with a hinged "side-guard". Because of the sectional ramp design, the guard consists of two non-connected pieces per side. The side-guards are not sufficiently rigid. Side-guards were bent by wheelchairs and by drivers trying to push them back into place. The height of the side-guard should be increased to at least 3 inches to help prevent wheelchairs from going over the side. (This exceeds the height recommended in D409, but, based on the observations of the vehicles in use, is desirable). The corners of the guard should be rounded or covered in plastic or rubber to ensure that neither passengers nor operators get caught or cut on the edges (refer to Figure 5).

Figure 6/ **Ramp Angle of Raised-Roof Vehicles, showing ramp partially extended (usual position when assisting disabled passengers) and fully extended**

A number of additional problems with the ramp design came to light during the course of the demonstration:

1/ The straps used to deploy the ramp on one of the raised-roof vehicles corroded and had to be replaced by the operator. The replacement straps are held in position with bolts which protrude from the surface of the ramp. They are a safety hazard to semi-ambulatory passengers.

2/ Ice build-up in front of the ramp housing hindered operation of the ramp. Operators of both of the raised-roof vehicles had to chip ice away from this area in order to deploy the ramp. In addition, because of ice build-up on the step, the door will not close properly.

Notwithstanding these problems, both semi-ambulatory passengers participating in the evaluation found the ramp on the raised-roof vehicles to be better than that on the lower-floor vehicles. The surface, even though it is not completely covered with a non-skid material, is more uniform and the gradient more gentle than on the lowered-floor vehicle. In short, the low quality workmanship on the ramp caused more problems for the drivers than the passengers.

6.1.1.2/ Ramp Features: Lowered-Floor Vehicles

The access ramp in the lowered-floor vehicle is lightweight and easier to deploy and stow than the ramp in the raised-roof vehicle. The ramp is sectional. It divides in half along the mid-line. It can be attached to either side of the vehicle by inserting pins located on the under surface of the ramp into holes drilled in the vehicle floor. The ability to load passengers from either side of the vehicle is clearly a desirable feature. Figure 7 shows the access ramp of the lowered-floor vehicles.

The ramp can be lifted by means of holes cut in the side guards of the ramp. Larger pins and a deeper housing would be desirable to ensure that the ramp is not dislodged during operation.

A uniform surface is important for passengers using walking aids. The ramp is covered with an uneven rubber/plastic material originally used for the interior flooring of the

Figure 7/ Access Ramp of the Lowered-Floor Vehicles

vehicle. Both of the semi-ambulatory passengers who participated in the ergonomics evaluation had a great deal of difficulty with the ramp surface. One of these passengers placed his crutches outside of the ramp on leaving the vehicle. In the case of the other passenger, one of his crutches slipped on the ramp surface. This type of ramp covering is totally unacceptable for an operational vehicle. The ramp surface should be replaced with a uniform height, non-skid surface.

The ramp is too steep. The elevation of the entry ramp is 17 degrees. (The ramp length is 91.5 cm. The distance from ground level to the floor of the vehicle is 27 cm.) The elevation angle far exceeds the recommended ergonomic limits -- a maximum recommended elevation level of 10 degrees. A ramp length of 153 cm would be required to achieve a ramp grade of 10 degrees. A rigid material should be used in the ramp. The ramp is too springy.

As in the case of the raised-roof vehicles, the side guard along both sides of the ramp should be at least 3 inches in height.

Although the ramp was used for the ergonomic elevation, the drivers of the lowered-floor vehicle reported that they do not use the ramp, except when loading or unloading passengers in motorized wheelchairs. Passengers consistently reported that they prefer the ramp to being tipped backward and hoisted up the 27 cm step from ground level to the vehicle floor. The drivers claim that using the ramp is too slow and messy in the winter.

The ends of the ramp are both painted in highly visible colour. Since the operators of the lowered-floor vehicle avoid using the ramp, except when loading motorized chairs, the paint remains in good condition.

6.1.1.3/ Restraints and Securements

Q-Straint. Both types of vehicle use the Q-Straint four-point tie-down system. Q-Straint has the virtue of attaching to the frame of the wheelchair and hence of not risking damage to

the chair. Q-Straint provides extensive crash test data and represents the accepted standard for wheelchair and scooter tie-downs.

The drivers of the lowered-floor vehicles were more skillful in the operation of the restraints. The tie-down process in the raised-roof vehicle takes between 2 and 3 minutes. Once the chair is properly positioned in the vehicle, the time required to attach the tie-downs and fasten the belts ranges from 2:20 (minutes:seconds) to 5:17 with a median of value of 2:38 .

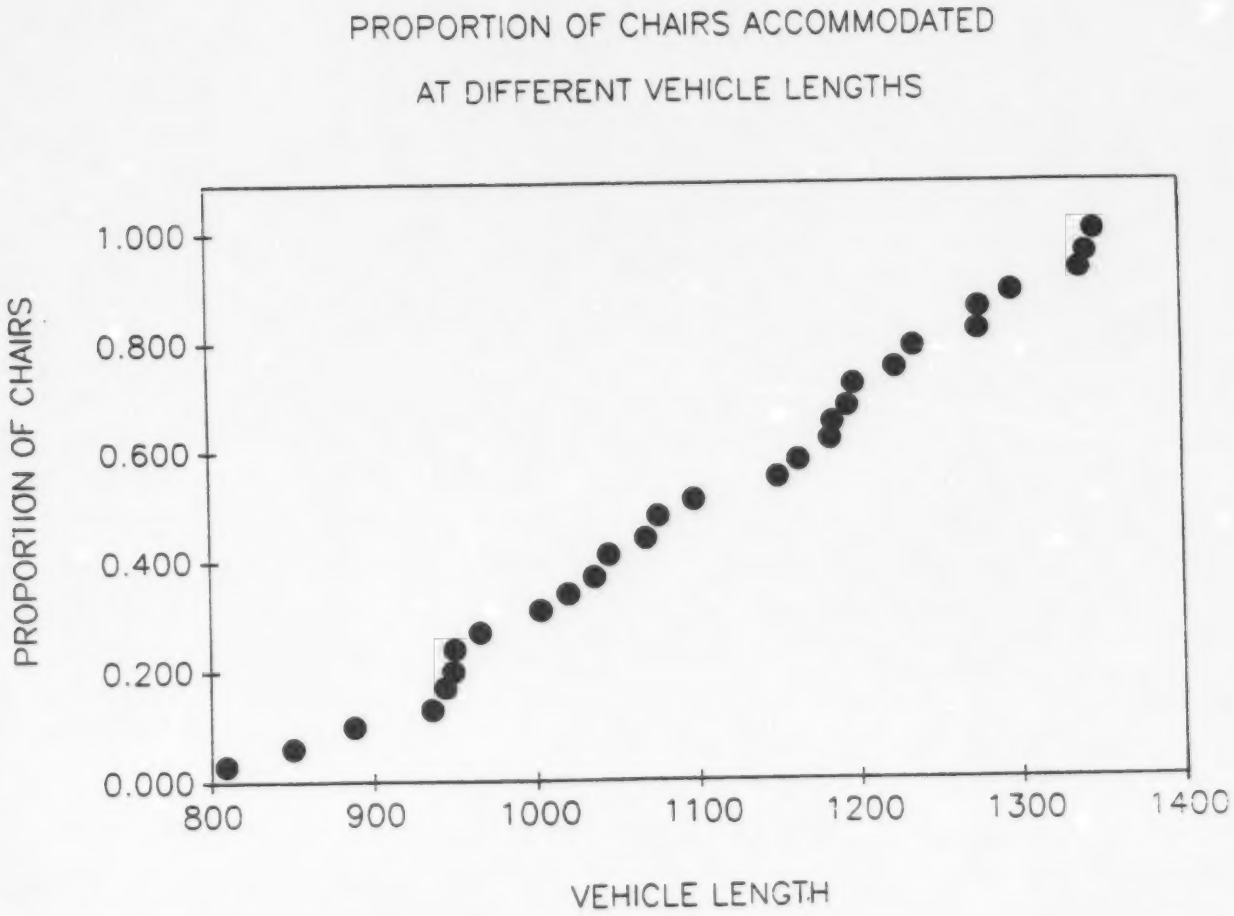
Shoulder belts. There is only one passenger shoulder belt in the raised-roof vehicle. When not in use, the belt is stowed around an interior pole located just behind the door on the driver's side of the vehicle. Typically the chair is positioned on the other side, behind the front passenger's seat. It is easier to manoeuvre the chair into this position. As a result, it is often necessary to extend the belt across the full width of the vehicle. This proved to be uncomfortable and provides virtually no lateral support. Clearly, the shoulder belt must be properly positioned. The present arrangement could well be dangerous since the belt could easily slip up around the neck area. Shoulder belts are needed on both sides of the raised-roof vehicle.

Stowage. There is no provision for the stowage of passenger walking aids in either vehicle or for the stowage of tie-downs in the raised-roof vehicle.

6.1.1.4/ Interior Design

The vehicles are able to accommodate most wheelchairs. The interior length of the raised-roof vehicles (from back of the driver's seat to the back seat) is 141 cm. The length of the lowered-floor vehicles is 131-1/2 cm. With a length of 135 cm, a vehicle can accommodate 90% of the wheelchairs on the market. Figure 8 offers a guideline on the proportion of a sample of wheelchair designs that can be accommodated in a forward-facing position for vehicles of varying interior length. Since the figure is based on a simulation in which the size of the operator is not considered, the figure should not be considered a detailed specification.

Figure 8 Proportion of Large Wheelchair Sample Accommodated Facing Forward at Various Floor Lengths



Source: Human Factors North Studies: Ergonomic Analysis; and complementary Studies of Wheelchair Accessible Vehicles

Notionally, the vehicles will accommodate two chairs. Due to the trough created by the ramp stowage arrangements, the useable width in the raised-roof vehicle is 10 cm less than that in the lowered-floor vehicle, giving rise to some concern about the ability of the vehicle to accommodate two chairs. In the lowered-floor vehicle, the seat next to the driver can be removed, providing space for another chair; however, there is no way to tie down the removable seat. Figures 9 - 11 show the tied-down passenger at different placements in both types of vehicles.

Door Frame. The door frame has been enlarged in both types of vehicles. Figure 12 and 13 show the entry doors of the raised-roof and lowered-floor vehicles.

Lighting. Good ramp lighting is essential both for night operation and for the aid of visually impaired passengers. The lights were not evaluated at night. Both versions are equipped with interior lights to provide illumination of the ramp. Interior lighting for boarding and unloading purposes is better on the raised-roof vehicle. In the raised-roof version, there are two lights above each door. In the lowered-floor vehicle, there are two lights, one a ceiling fixture, the other almost at floor level.

Entry Door. The dual entry doors on the lowered-floor vehicle are a desirable feature which greatly aids passenger access. The top of the entry door is padded on both vehicles. The padding on the lowered-floor vehicle is better than the padding on the raised-roof vehicle. Also, on the lowered-floor vehicle, the driver has added fluorescent tape to the door frame to alert passengers to the edges of the door frame. This should be a standard feature of these vehicles. Yellow weather stripping at the edge of the door is loose in both vehicles.

Ramp Enclosure. The ramp enclosure in the raised-roof vehicle is covered with a 3/8 inch piece of plywood and then carpeted on the interior of the vehicle. The plywood surface bends when a passenger is inside the vehicle. This makes the passengers feel uncomfortable and it makes it difficult for the driver to stow the ramp after loading. The surface needs to be better supported.

Figure 9/ Fully Tied-Down Passenger, Rear Placement (Lowered-Floor Vehicle)

Figure 10/ Fully Tied-Down Passenger, Forward Placement (Lowered-Floor Vehicle)

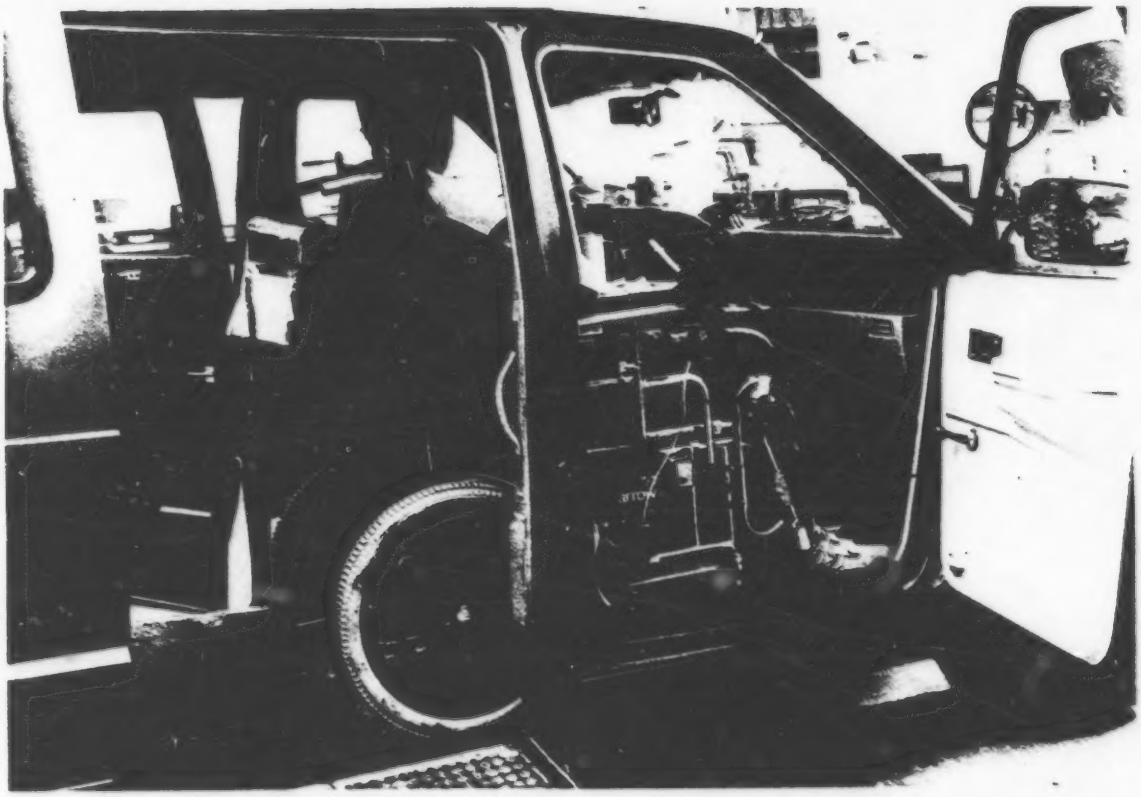


Figure 11/ Fully Tied-Down Passenger, Rear Placement (Raised-Roof Vehicle)

Figure 12/ Raised-Roof Vehicle: Entry Door

Figure 13/ Lowered-Floor Vehicle: Entry Doors

Front seat. The front seat of the lowered-floor vehicle is removable. It rolls in and out of position on casters. This enables a wheelchair passenger to ride alongside the driver. Passengers reported that they often felt more secure riding in this position. However, there is no stowage area for the front seat when it is removed and it is not fastened down. This presents a safety hazard. Figures 14 and 15 show the removable front seat of the lowered-floor vehicle.

Rear seat. The rear seat in the raised-roof vehicle is sectional. It can be folded up to make more room for the wheelchair and to provide space for the driver when securing passengers. The rear seat in the lowered-floor vehicle is too high. No adjustment has been made in the seat height after lowering the vehicle floor. Figure 16 shows the rear seat in folded position.

Carpeting. The interior of the raised-roof vehicle is carpeted with a tough indoor-outdoor material. Both of the passengers using crutches expressed a preference for the carpeted interior over the non-carpeted surface in the lowered-floor vehicle. The carpeting also lowers the ambient noise level which is particularly desirable for passengers using hearing aids. However, carpeting restricts wheelchair mobility. A surface which is sufficiently firm for wheelchair mobility, but at the same time offers adequate grip for crutches, is needed.

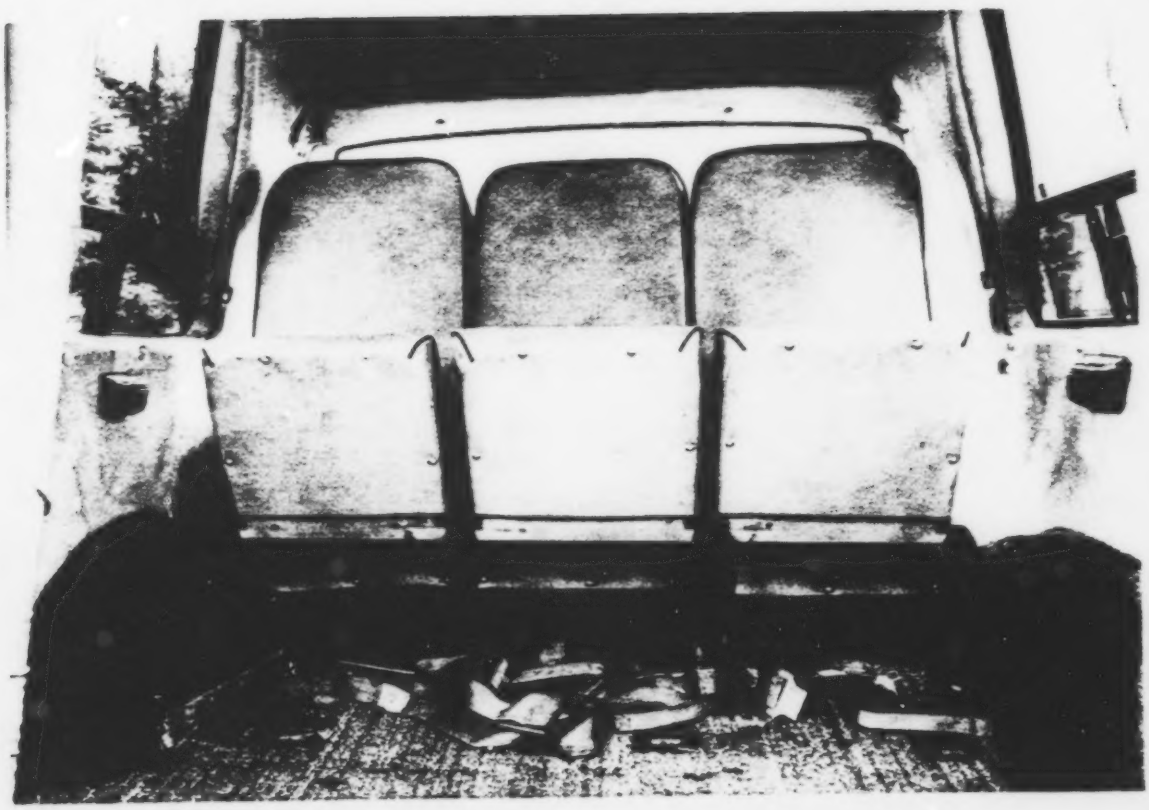
Hand grips. The inside of the entry door on the raised-roof vehicle is fitted with a hand grip at a level appropriate for use by wheelchair passengers. This is a good design feature. A hand grip at the forward edge of the door of the lowered-floor vehicle should be added to assist passengers boarding the vehicle.

Windows. The rear windows in the raised-roof vehicle are hand-controlled and generally inaccessible to passengers in wheelchairs. Driver and/or passenger controlled power windows would be preferable.

Figure 14/ Removing the Front Seat of the Lowered-Floor Vehicles

Figure 15/ Location of Front Seat (Removed) of the Lowered-Floor Vehicle

Figure 16/ Raised-Roof Vehicle: Rear Seat in Folding Position



Additions to the vehicle. A radio and first aid kit have been mounted on the dash and forward bulkhead (just ahead of the front seat on the passenger side) of the raised-roof vehicle. These items should be relocated so as not to be a potential danger in the case of an accident.

6.1.1.5/ Operator-Related Design Features

Rear visibility is provided by large side-view mirrors on each side of the vehicle and a 5 inch convex side mirror on the side opposite the driver. In the raised-roof vehicle, visibility through the rear window of the taxi is completely blocked by the rear seat. The drivers recommended that a back-up (reverse) warning signal be installed.

The lowered-floor vehicle has a sliding door. One of the drivers has developed tendonitis, possibly from reaching across the vehicle to slide the passenger door closed. This problem could be avoided if the driver took the time to move over to the door in order to slide it closed.

The ergonomic evaluation of the two vehicle designs gave rise to a number of suggestions to improve the vehicle. Figure 17 summarizes the recommended improvements to the accessible taxis that were used in the demonstration project.

6.1.2/ Task Analysis of Assisting Passenger to Enter and Exit the Vehicles

The task analysis is comprised of two aspects: a qualitative description of the procedure, including a biomechanical evaluation of the task; and a quantitative and detailed analysis of the times required to perform the basic components of the task. For reference, a detailed breakdown of the task time requirements is provided for each passenger for all of the conditions in which they participated. Average times are also provided for specific tasks and for specific classes of passenger.

Figure 17/ Recommended Improvements to the Accessible Taxis

Recommended Features	Raised-roof Vehicles Features Available	Lowered-floor Vehicles Features Available
Ramp:		
- Ideal angle under 10 degrees	15 degrees	17 degrees
- Side-guards 3 inches, corners rounded or covered in plastic or rubber	Hinged side-guard, bends with use.	
- Completely covered with non-skid surface	Strips of non-skid material, uneven.	Covered with uneven rubber/plastic material.
- Tapered flaps at all transition points	Uneven transition points	
- No sudden changes in elevation in ramp system		
- Single ramp. Split ramp undesirable from the point of view of passengers. Such a ramp will not accommodate scooters or passengers in motorized chairs	Sectional ramp, uneven ramp surface	Sectional ramp, lightweight, too springy, but easy to deploy and stow. Deployed by means of straps can be attached to either side of the vehicle.
- Motorized lift would be better. Under-the-floor ramps are difficult to deploy; problems with ice build-up. Motorized lift, less obstructive, less like a purpose built taxi.	Under-the-floor ramp, deployed manually. Sectional, uneven ramp surface. Addition of plastic and inner ramp sections.	Too short.
Restraints and Securements:		
- Ample room for tie-downs so driver does not have to assume awkward positions		
- Schematic showing the mechanical principles of securing a chair		
- Schematic showing suitable tie-down points for different or unusual chairs		
- Shoulder belts on both side of the vehicles		

Figure 17/ (continued) Recommended Improvements to the Accessible Taxis

Recommended Features	Raised-roof Vehicles Features Available	Lowered-floor Vehicles Features Available
Interior Design:		
- Good lighting essential	2 lights above each door	2 lights -- one a ceiling fixture, one at floor level
- Carpeting. Non-slip surface that is sufficiently firm for wheelchair mobility, but offers adequate grip for crutches	Indoor-outdoor carpeting	No carpeting
- Adequate interior space (space adequate for all but largest power chairs)		Removable front seat (no stowage area). Rear seat too high. Some shortage of space. Need a fold-up chair similar to raised-roof vehicles.
- Fluorescent tape/paint to alert passengers to edges of the door frame, edges of the step, ends of the ramp	Paint worn off	Paint visible. Added tape.
- Hand grips to assist passengers boarding the vehicle	Hand grip	No hand grips
- Provision for the stowage of passenger walking aids	No stowage area	No stowage area
General:		
- Ramp should always be used		
- Proper driver training for new drivers essential		

The task analysis is based on on-site observations, as well as careful analysis of video-taped sessions, in which passengers entered and exited the vehicles. Video-taped tests of entry and exit were completed for both the raised-roof and lower-floor vehicles. The same passengers were used to test both taxis. However, different drivers were involved for each vehicle and, therefore, differences in performance times (e.g. loading time, securement time, etc.) may be due, in part, to driver differences.

The task of assisting entry into the vehicles was broken down into the following components:

1/ Deployment of the ramp, entry of the passenger into the vehicle.

2/ Positioning of the passenger inside the vehicle prior to securement.

3/ Attachment of the tie-downs and fastening of the safety belts.

4/ In the case of the lowered-floor vehicles, the front seat was sometimes removed. This formed another component of the entry task.

The exit procedure was broken down into similar components:

1/ Unfastening of safety belts and release of tie-downs.

2/ Assisting the passenger in preparation for exit.

3/ Exit from the vehicle

4/ Stowage of the ramp.

5/ In cases where the front seat had been removed, replacement of the front seat was also examined.

Seven physically disabled volunteers, using a variety of mobility aids, participated in the ergonomic evaluation. Three of the participants used manual wheelchairs, one used a power wheelchair, one used a scooter, and two of the participants who are semi-ambulatory, used crutches. Participants entered and exited both the raised-roof and lowered-floor vehicles. Some of the participants (two of the participants with manual wheelchairs and the two semi-ambulatory passengers) were entered and exited with and without the ramp deployed.

6.1.2.1/ Task Components and Biomechanical Considerations

The loading procedure generally comprises the following steps: deployment of the ramp, entry of the passenger into the taxi, positioning of the passenger into an appropriate location inside the taxi, and the securement of the passenger (and his/her wheelchair or scooter) with tie-downs and safety belts. However, in many instances, drivers do not deploy the ramp in order to load passengers. In addition, the front right (passenger) seat in the Blue-Line Taxi (lowered-floor vehicle) may be removed in order to position passengers in this location. The exit procedure essentially comprises the same components in reverse order.

6.1.2.1.1/ Deployment and Stowage of the Ramp

In the Blue-Line (lowered-floor) vehicle, ramp deployment does not require excessive physical effort. The driver retrieves the ramp from its stowage location (in the rear of the taxi) and then simply places it in position. The ramp is not particularly heavy and may be lifted safely by both male and female drivers of average stature. In contrast, the ramp in the A-1 taxi (raised-roof vehicle) is difficult to deploy and stow. Drivers were often required to exert a considerable pulling (or pushing) force on the ramp while in a bent position. Thus, they are placed at risk for back strain. In order to correct this situation, the ramp should be modified so that it slides more readily and requires less force to deploy. In addition, longer straps located on the ramp (the present straps are quite short) would enable the drivers to pull from an upright position rather than the bent position when deploying the ramp.

Figures 18 and 19 show the deployment and stowage of the ramp for the lowered-floor vehicle. Figures 20 and 21 show the same activity for the raised-roof vehicle.

Figure 18/ Deployment and Stowage of Ramp, Lowered-Floor Vehicle (Retrieving/Storing Ramp)

Figure 19/ Deployment and Stowage of Ramp, Lowered-Floor Vehicle (Deployment Ramp)

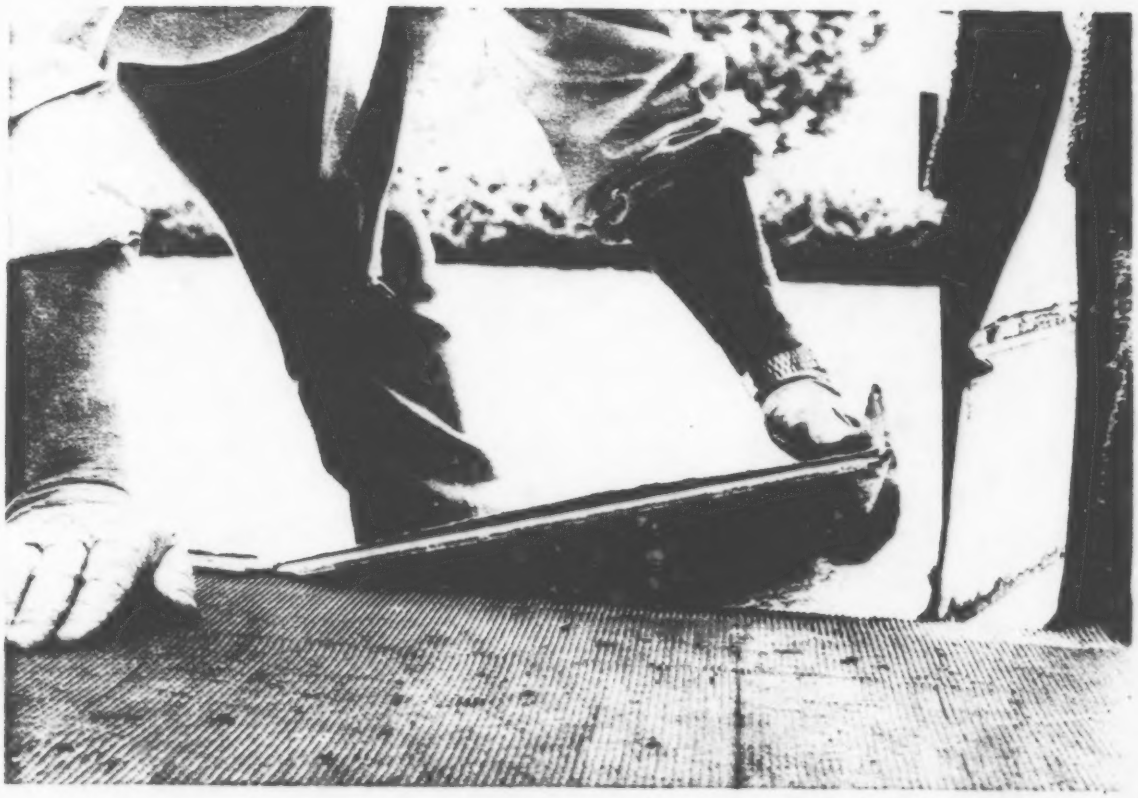


Figure 20/ Deployment and Stowage of Ramp, Raised-Roof Vehicle

Figure 21/ Deployment and Stowage of Ramp, Raised-Roof Vehicle

6.1.2.1.2/ Entry Into and Exit From the Taxi

Since the ramp used with the Blue-Line (lowered-floor) Taxi is short, the slope of the ramp is very steep (17 degrees). Consequently, a considerable force is required in order to ascend (and descend) the ramp. With manual chairs in particular, the driver must therefore exert a relatively large effort in order to assist the passenger entering and exiting the vehicle. Figures 22 and 23 show the entry/exit from the lowered-floor vehicle (with ramp).

In several instances, drivers of the Blue-Line taxis were observed assisting wheelchair passengers directly into the taxi without deploying the ramp. In these cases, the driver tilts the wheelchair backwards at an extreme angle (approximately 45 degrees), places the front wheels of the chair inside the taxi, and then lifts the passenger into the taxi. This procedure was demonstrated, with the passenger's permission, for Figure 22. This requires a substantial physical exertion which may place the driver at risk for back and arm injury. In addition, passengers typically do not like being tilted backwards and are justifiably concerned about the driver's ability to assist them safely into and out of the vehicle.

In the A-1 Taxi, the ramp is longer but the floor is higher. Thus, the slope of this ramp is also steep (15 degrees). Due to discontinuities between the ground surface and the ramp and between the ramp and the A-1 Taxi floor, the driver is often required to tilt the wheelchair during entry and exit of the vehicle. This requires an additional effort on the part of the driver and is uncomfortable for the passenger. Figures 24 - 26 display entry into the raised-roof vehicle (with ramp).

6.1.2.1.3/ Securement

Once the driver assists the passenger into a suitable position within the taxi, the driver then secures the wheelchair or scooter with four "tie-downs" and fastens the safety belts about the passenger. During this task (especially the tie-downs) drivers often were forced into somewhat awkward positions which included kneeling, bending, splaying, twisting, and stooping. While excessive twisting, bending, etc. can be avoided with proper technique, reasonable flexibility is required of the driver. Individuals without adequate flexibility may

Figure 22/ **Entry/Exit from Lowered Floor Vehicle, showing access from both sides of the vehicle, correct use of the ramp from a level parking lot and incorrect "tip-in" procedure from a sidewalk**

Figure 23/ Entry/Exit from Lowered Floor Vehicle

Figure 24/ Entry into Raised-Roof Vehicle showing proper use of ramp, fully extended

Figure 25/ Entry into Raised-Roof Vehicle showing improper use of ramp (partially extended)

Figure 26/ Entry into Raised-Roof Vehicle showing driver tilting the wheelchair to clear the discontinuity between the ramp and the vehicle floor

be at risk. Figures 27 and 28 display the use of Q-Straints showing awkward driver position.

6.1.2.2/ Timing Information

The average times required to perform the various components of the entry and exit procedures are presented in Figure 29 for each type of vehicle. Average entry and exit times are provided separately for semi-ambulatory (SA) passengers as opposed to those passengers with wheelchairs or scooters. Note that the times provided for deploying and stowing the ramp (and the front seat in the case of the lowered-floor Blue-Line taxi) and for assisting the passenger within the vehicle are averaged across both the entry and exit tests.

Several points may be emphasized regarding Figure 29 First, the times required to deploy and stow the ramp are small (approximately 1/2 minute). Similar times are required to remove, stow, and replace the front seat in the case of the lowered-floor Blue-Line taxi. Consequently, avoiding use of the ramp is not justified by time considerations. Moreover, the average times required to assist passengers entering the vehicle with and without the ramp are similar.

For both the A-1 and Blue-Line (lowered-floor) taxis, the time required to secure passengers into position was less than 3 minutes. This is less than drivers' impressions. The total times required for the passenger to enter (deploy ramp, enter taxi, position passenger, secure passenger, stow ramp) the A-1 (raised-roof) and Blue-Line (lowered-floor) taxis are 4:08 and 3:53 respectively. The total times to exit (deploy ramp, release passenger, manoeuvre passenger, exit taxi, stow ramp) are 2:24 and 2:36 for the A-1 (raised-roof) and Blue-Line (lowered-floor) taxis.

Appendix C provides detailed timing information pertaining to specific entry and exit tasks on a trial-by-trial basis. The appendix shows passenger classification, the taxi (A-1 or Blue-Line), type of wheelchair and wheelchair dimensions (where appropriate), and the location in which the passenger was secured. Mean times (averaged across trials) are also provided.

Figure 27/ Use of Q-Straints Showing Awkward Driver Position in Raised-Roof Vehicle

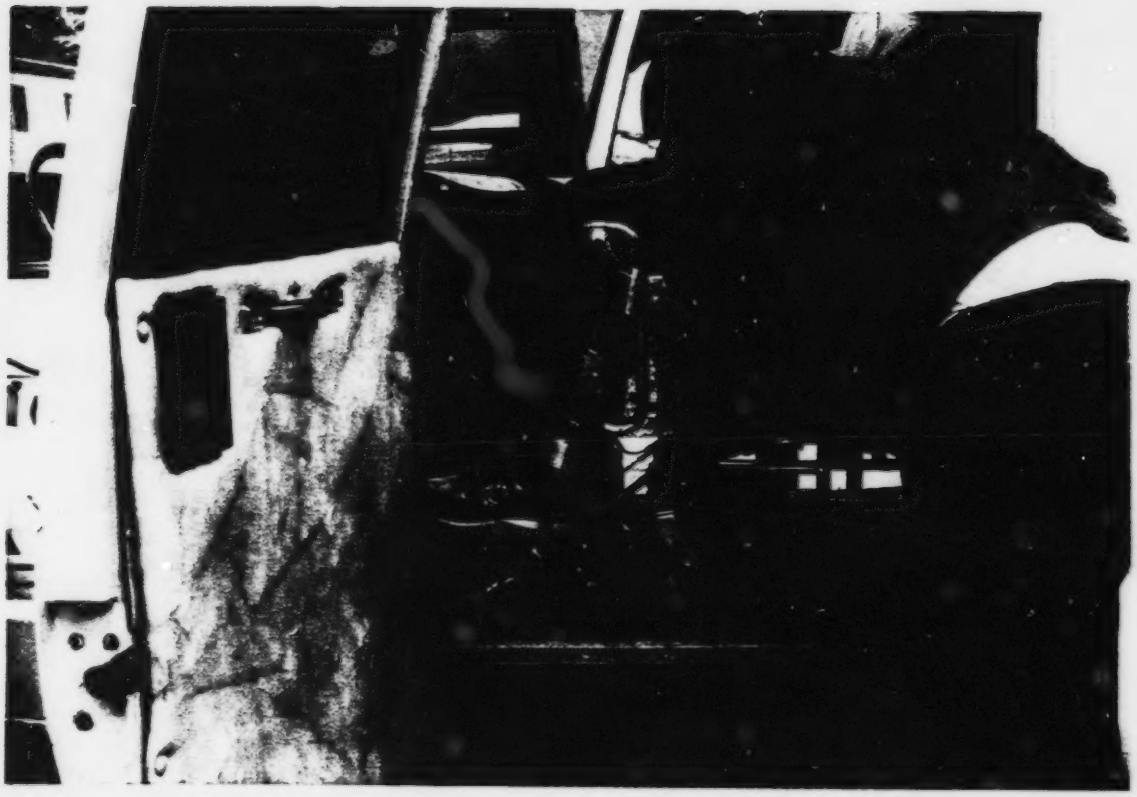


Figure 28/ Use of Q-Straints Showing Awkward Driver Position in Lowered-Floor Vehicle

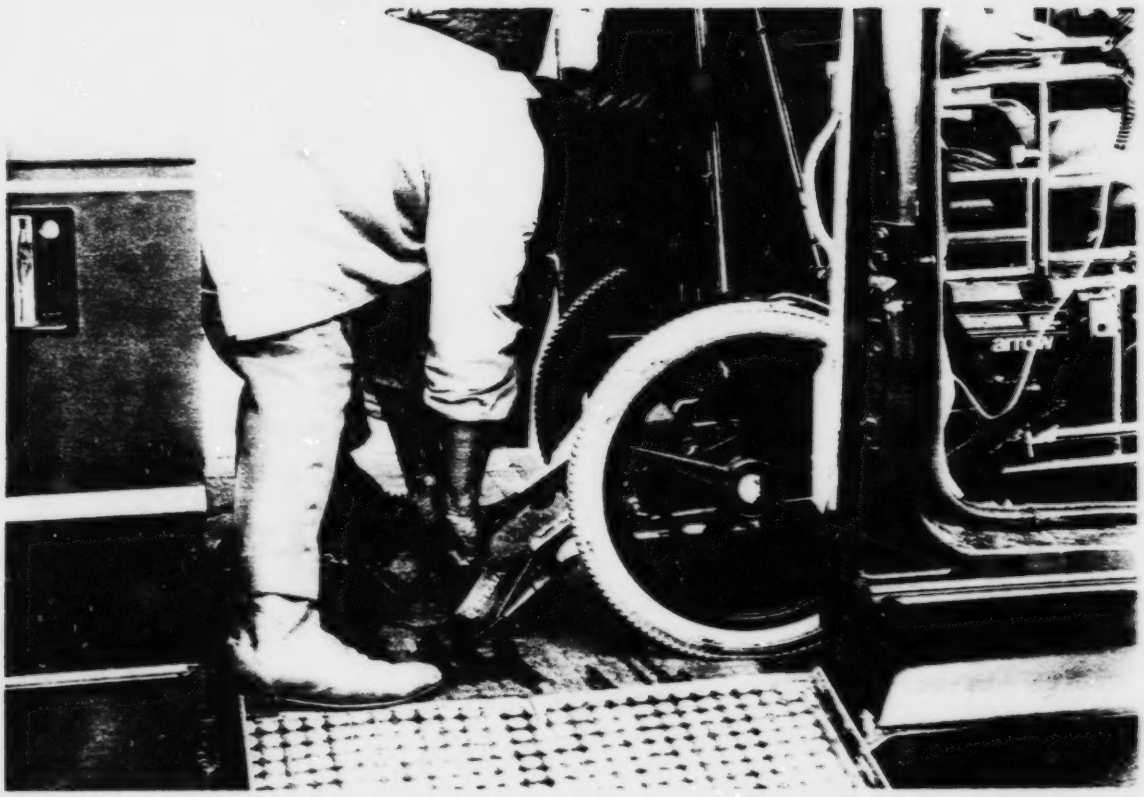


Figure 29/ Passenger Entry and Exit Times

	Time to Perform the Task	
	A-1 Taxi Raised-roof Vehicles Minutes: Seconds	**Blue-Line Taxi Lowered-floor Vehicles Minutes: Seconds**
Deploy Ramp	:18	:32
Stow Ramp	:27	:25
Enter Taxi	:13	:14
Exit Taxi	:10	:10
Positioning (Entry)	:30	:31
Maneuvering (Exit)	:31	:25
Securement	2:42	2:31
Release	:48	:51
Remove Seat *		:18
Stow Seat *		:21
Replace Seat *		:22

* Blue-Line (lowered-floor vehicle) only

6.1.3/ Summary and Conclusions from Ergonomics Evaluation

Ramp design and workmanship on these vehicles are unacceptable for routine use in taxi service. The ramp used in the lowered-floor vehicle is too short, too springy and covered with an inappropriate surface material. The ramp in the raised-roof vehicle is poorly finished, lacks a complete non-skid surface cover, has uneven edges at 1/ the meeting between the ramp and the ground, 2/ at the junction between the inner and outer ramp, 3/ between the main ramp and the flap adjoining the vehicle and 4/ between the flap and the floor of the vehicle. The ramp on the raised-roof vehicle has poorly constructed side guards which bent out of shape a number of times during the ergonomic evaluation. The ramp was exceedingly difficult to deploy and stow. Plastic tracks are essential for this type of ramp.

The ramp of the lowered-floor vehicle has certain positive features. It is lightweight, easy to deploy and stow, and can be attached to either side of the vehicle. These desirable features should be preserved in a re-design of the ramp system.

The Q-Straint tie-down system requires more space than its competitors for installation but it is less likely to damage chairs and has been more thoroughly tested than competing devices. It is the dominant design at this time.

Tie-downs were often poorly done and ineffective. Several drivers noted that the tie-down procedure often took a considerable time for wheelchairs or scooters that they had not previously encountered, especially in cases where obvious and suitable tie-down points could not be readily identified. Some consideration should be given to facilitating the tie-down of wheelchairs (and in particular scooters) that do not have adequate securement points. For example, a belt with four affixed eye-hooks which could be fastened about a wheelchair or scooter could provide a base for the attachment of tie-downs. Further, a driver's manual with descriptions (including photographs or pictures) of correct tie-down layouts for a number of chairs and scooters should be developed.

Hand grips should be added about the entry doors on both vehicles.

A lack of driver training in the case of the raised roof vehicle marred the demonstration from an ergonomic point of view. Driver failures seen during this evaluation with respect to passenger loading and unloading as well as the use of the tie-down system are unacceptable in a commercial operation.

The disabled participants in the ergonomic evaluation expressed a preference for the lowered-floor vehicle which they felt "looks like a taxi". To the extent possible, the vehicle should not look like a vehicle for the disabled.

6.2/ TES Limited Review

Following the preliminary assessment of the vehicles, TES Limited was retained, under separate contract, to conduct an engineering review of the two raised-roof vehicles. The assessment performed by TES is based on conformance with the various standards, especially D409, Motor Vehicles for the Transportation of Physically Disabled Persons. Emphasis was given to the ramp design. The assessment found that the vehicles met the standard. The following problems were, however, identified:

1/ The surface of the ramp should be made of skid-resistant material. In this instance, less than 50% of the surface was covered with skid-resistant material. It was recommend that the entire surface of the ramp be covered with skid-resistant material.

2/ The gradient of the ramp fell within the required standards. However, there was a shorter section at the top of the ramp which formed a transition from the ramp to the taxi interior which exceeded the requirement and created some difficulty in loading passengers. This section should be reconfigured to provide a smoother transition.

3/ When the ramp is stored, the transition ramp forms a cover for the storage space at the side door step. This cover was not long enough on one of the vehicles. A gap remained on the side door step which could potentially trip a passenger entering the door. As well, the cover reduced the step depth to 190 mm (7 1/2 inches) which is under the required depth of 215 mm (8 1/2 inches). This should be reconfigured by moving the hinge point and/or spring loading the hinge.

4/ The ramps on the two raised-roof vehicles differed in the design of the pull out handles. One design incorporates straps; the other uses an upright aluminum flat bar. (The straps are the preferred option as the uprights are a potential hazard in both the stored and the pulled-out mode.) The ramp design incorporating the aluminum upright handles was found to have insufficient positive stops for the ramp extension on both

the primary ramp and the secondary telescoping ramp. The primary ramp requires a stop on the rearward side in addition to the one existing on the forward side. The stop on the secondary telescoping ramp was found to have cracked welds and be severely deformed. This should be replaced with a more robust component.

5/ Although there is no strength requirement for the flip-up guards, they were found to be weak and, one lower section could be easily over extended and flattened. A steel, rather than aluminum, hinge would be more suitable for this application.

6/ When pulling out the ramps for use, there is a metal on metal contact which has worn away the paint on steel surfaces and creates binding and difficulty for the operator. The addition of nylon runners and guides would alleviate these problems.

7/ Several examples of poor workmanship within the ramp storage compartment were identified. Much of the steel was found to be unfinished and beginning to corrode. Several welds were of very poor quality. In several areas the steel was torched or ground to suit, with rough exposed areas. As well, there was no evidence of any undercoating on the underside of the vehicle in the modified area. Corrosion had begun in most of these locations.

The substitution of straps for the two angle irons that projected above the ramp ends was the only substantial modification made to the raised-roof vehicles prior to the actual demonstration phase.

6.3/ Operator Observations

6.3.1/ Blue Line Taxi

6.3.1.1/ Initial Experience with Raised-Roof Vehicles

As noted above, Blue Line initially contracted to operate the four test vehicles. However, after limited experience with the raised-roof vehicles and numerous discussions and meetings with Transport Canada staff and the Ottawa Accessible Taxi Demonstration Executive Committee, Blue Line opted to withdraw the two raised-roof vehicles from its fleet as of June 12, 1989.

From the beginning, Blue Line expressed serious reservations about the design of the raised-roof vehicle with respect to passenger seating, wheelchair alignment, ramps, vehicle

protuberances and overall unattractiveness. Based on these weaknesses, Blue Line felt that the drivers would have little incentive to select the accessible taxi over a conventional taxi. Not only would it be difficult to select and retain drivers willing to work with disabled passengers, there might be a monetary disincentive, given that these vehicles could be less attractive to the general public.

Prior to testing the vehicles, in anticipation of the demonstration, Blue Line submitted a list of modifications to Transport Canada that, in Blue Line's view, were required before the demonstration could proceed. Transport Canada arranged for Air Surrey, Cambridge Ontario to address the concerns stated by Blue Line:

1/ "Running Boards be put on both sides of the front doors.

2/ "Ramp, either a pull out type that will go in and out easily, or the installation of an electric ramp.

3/ "Spare tire to be mounted on a swing bracket on the rear of the van.

4/ "Padding on both sides of the rear door coming off.

5/ "Panel in front of van at cap window, cut down or remove and must be padded better.

6/ "Q-Straint box rear of front tie-down, bolts put in upside down.

7/ "Ash trays in the rear seat area.

8/ "Regular bench type, leave under side open for luggage space.

9/ "Two (2) foot square ground plane in roof between liner and roof.

10/ "Move front Q-Straint tie-down position back 12".

11/ "Door edge finish trim on large side door.

12/ "Cargo netting in front passenger door area.

13/ "Drain in front for water.

14/ "Rear heater."

These concerns were addressed before the vehicles began pre-demonstration trials and before the TES review.

After some operating experience with the vehicles, the drivers took the position -- and Blue Line concurred -- that the appearance of the vehicle was hindering its acceptance by the public. Blue Line paints its vehicles dark blue and relies on a roof sign to identify the vehicle as a taxi. The raised-roof vehicles did not look like taxis, rather they looked like an ambulance or bus. They did not display a roof sign very well. Consequently, people did not recognize them as a taxi and did not flag them down. (For conventional taxis, Blue Line staff estimate that up to three-quarters of city fares are flag downs or stand pickups; this drops to about one-quarter in suburban areas.) Moreover, in a taxi stand, passengers would by-pass the vehicles for a conventional taxi. During the preliminary trial period, drivers of these vehicles reported losing 40% and 75% of their income respectively, compared to driving a standard taxi.

6.3.1.2/ Initial Experience with Lowered-Floor Vehicles

Blue Line identified a number of features that, in the company's view, required attention on the lowered-floor vehicles before the demonstration could begin. Transport Canada arranged for the supplier, Care Concepts to address the concerns stated by Blue Line:

1/ "Spare tire to be put on swing rack on rear of van.

2/ "Power open for rear deck, or change lock on rear to different from ignition.

3/ "Lettering on both side doors be in white so it can be seen.

4/ "Ash trays in rear seating area.

5/ "Lighting in the driver's area, middle of van, and emergency door area.

6/ "Passenger restraint on the right front seat has no female connector on the seat. It has been put on driver's seat and if van hit from side, person in that seat could be thrown to the left and fall onto floor between the seats.

7/ "Any new design should have arm rests on both front seats.

8/ "The body of the vans should be the extended type.

9/ "Rear springs are hitting the box that has built over axle and wheelwell.

10/ "Ramp should be of a lighter material.

11/ "More comfortable driver's seat, and position (seat does not go back far enough).

12/ "If possible, move heater more under driver's seat.

13/ "Transmission oil cooler."

These concerns were addressed before the vehicles began pre-demonstration trials.

6.3.1.3/ Blue Line Taxi: Overall Reactions to Operation of Accessible Taxis

From Blue Line's point of view, the vehicles are too expensive. The taxi industry is moving away from purchasing fleets of new vehicles. Current practice is to buy four-year-old vehicles (often used police cars) at about a third the cost of a new vehicle. If Blue Line were to buy new vehicles, the typical vehicle that would be purchased would be a Ford Crown Victoria four door sedan with a "police pack" (heavy duty seats, alternator, suspension, etc.) which sells for about $20,000. By comparison, an accessible vehicle costs $30,000 to $35,000. The impact of this policy on the economy of taxi operations is discussed in a later section.

The company believes the cost to keep the accessible vehicles on the road is about the same in dollars per kilometer as the four-year-old vehicles typically purchased to serve as conventional taxis. While the service experience is short, Blue Line has noted that the vehicles are based on 1987 Chrysler vans -- a model year that is reputed to give poor service. Further, Blue Line believes that the ideal taxi vehicle should have a separate frame with rear wheel drive. The Chrysler vans use "unibody" construction, a method that reduces the overall weight of the vehicle body, but, in Blue Line's view, makes the vehicle less robust. Further, the vans use front wheel drive, a system that in Blue Line's view is not suited to heavy duty taxi operations.

The conversions to the van represent a further risk to reliability. For example, when the conversion was being installed on the high roof vehicles, rather than installing a new wiring harness to the rear of the vehicle, the conversion company cut the wiring harness and patched around the conversion. Unfortunately, an error in the revised wiring created

problems that took the taxi company many hours to identify and correct. It is generally felt that the standard of workmanship on the conversion is much lower than that on the vehicle itself. Durability is expected to suffer -- no attention to rust-proofing, corrosion protection, etc. When the vehicles were received, they were already showing visible rust on some of the welds involved in the conversion.

6.3.2/ A-1 Taxi: Overall Reactions to Operation of Accessible Taxis

On October 20, 1989, A-1 Taxi assumed operation of the raised-roof vehicles. A-1 expected to have less difficulty with the recognition problems that plagued Blue Line. A-1 painted the vans a bright yellow (their company colour), printed TAXI in large letters across the vehicle, and found a way to add a roof-top sign.

A-1 reports that its experience with the demonstration project is excellent, since it is not responsible either for maintenance under warranty or for the purchase price of the vehicle. However, in conventional operation of company-owned vehicles, the company believes the vehicles are too expensive and are "impossible to maintain". In particular, one vehicle has had repeated breakdowns, to the point that drivers will not accept an assignment to the vehicle. A-1 attributes the majority of its driver turnover to unreliable vehicles, not to frustration or disillusionment with providing an accessible taxi service.

A-1 suggests that the vehicles would be more acceptable in conventional service if bench seats were provided in the usual location. With careful design, the seats could be installed and could be moved (folded and retracted) when the vehicle is to be used by a wheelchair passenger. Such an arrangement would provide the vehicle with higher seating capacity than a conventional taxi.

In the company's view, a special purpose vehicle would likely be impossibly expensive to produce and therefore to purchase. The company prefers the concept of an accessible taxi based on a standard model van that has been converted to service as an accessible taxi. Further, company representatives have advocated that conversions be done on used

vehicles in order to bring the total price of the accessible taxis to a level that is more competitive with conventional taxis.

6.4/ Driver Observations

Over the course of the demonstration, drivers were afforded several opportunities through the training sessions and the driver quarterly meetings to comment on the vehicles. The drivers took this opportunity to make a number of observations.

Both versions were seen to suffer from recognition problems. However, the problem was perceived to be worse in the case of the raised-roof vehicles. Also, this lack of recognition extended to fares obtained via the dispatcher and resulted in time loss while the customers became familiar with the vehicle. After limited experience with the vehicles, Blue Line drivers refused to drive the raised-roof vehicles.

The reactions of drivers at A-1 to the raised-roof vehicles were similar. After some experience with the vehicles, all of the original drivers transferred off the accessible taxis. The general sentiment seems to have been that driving the vehicles was "too much of a bother". A major concern seems to have been the need to explain the purpose of the vehicle to every passenger who rode in it. In the view of one of the drivers, the van "rides like a truck". He was embarrassed to drive the vehicle. In his words, "The vans are really ugly!" His willingness to continue to drive such a vehicle is contingent on a new model that looks like a "regular vehicle" and is not "so obvious".

After some months working with the vehicles, all of the drivers expressed major concerns about the modification. They believe the design is generally "poor". It is difficult to load two wheelchairs. The ramp is a major problem. They believe the vehicles have been designed for somebody "who wants to pick their daughter up twice a week". They are "not built for commercial operation".

Drivers generally liked the lower-floor vehicles. Modifications were made to the rear suspension to improve the ride and reduce bottoming of the suspension. There was some

criticism about the hinged door on the curb side, the poor finish, and rusting, but in general, the vehicles were seen to handle well; the seating was good; and it was easy for wheelchair passengers to enter the vehicle. The ramp was easy to use, if it had to be used at all; and only took two or three attempts to become proficient in its use. Drivers estimate that it only took three and one-half to four minutes to assist a person in a wheelchair to enter the vehicle and to secure the chair and passenger.

In the initial view of the drivers, the lowered-floor vehicle is the "accessible taxi of the future". Towards the end of the demonstration, drivers of the lower-floor vehicles were beginning to complain about problems maneuvering wheelchairs inside the van. The way the van is constructed, the drivers cannot bend their knees to take the weight. There were new suggestions that this is the "wrong vehicle for the job". However, passengers in general, like the vehicle. Non-disabled riders like its size and seating, but not its ride; disabled people "love the vehicle". Senior citizens find it easier to enter than a conventional taxi. The raised-roof vehicles, on the other hand, were perceived to be "more like a purpose-built vehicle for the disabled than a taxi"; and, as such, were less acceptable to the public.

Somewhat related to this is the question of "handicapped decals". The drivers are convinced that the addition of "handicapped decals" interferes with their ability to attract non-disabled passengers. They believe the campaign to discourage non-disabled drivers from using accessible parking spots has carried over to the accessible taxis. Passengers are reluctant to use a service they believe has been designated for disabled persons. In their view, the decals should be removable, added only when disabled persons are transported in the vehicle.

Drivers generally believe that neither vehicle is suitable for the heavy use of a taxi operation. They expressed concern about the basic design features (ramp, maneuvering, room, etc). The quality of work on the modifications was also criticized -- visible rust after one winter, poor fit of doors, etc.

Drivers believe that the appropriate vehicle would be a full-sized van with a hoist. Several drivers talked enthusiastically about designs they had seen that, in their view, would be more appropriate to the task than either of the designs used in the demonstration.

6.5/ Passenger Rating of the Accessible Taxis

The self-complete questionnaire distributed to passengers of the accessible taxis provides a series of ratings of vehicle characteristics. Overall, passengers reacted very positively to both types of accessible vehicles. The questionnaire asked all passengers to rate vehicles on five characteristics and disabled passengers to rate the vehicles on seven additional characteristics. The results are shown in Figure 30. The figure shows the results for all passengers combined and then the individual results for Blue Line and A-1, reporting the average rating and the standard errors (the confidence interval for the estimate of the average or mean of the ratings). These data provide a test of the statistical significance of differences between the mean ratings. To assist interpretation of these results, the figure has "boxed" the ratings that show one style of vehicle was preferred and the difference was statistically significant. Those vehicle characteristics which were given quite low ratings (below 8.00) are "shaded".

Note that there were insufficient passengers in the "ambulatory disabled" category for their ratings to be meaningful in this comparison. Therefore, they have not been included in the summary.

The results should be interpreted with caution. As noted above in Chapter 3, the analysis has attempted to clean the results provided by passengers to eliminate those ratings where the driver appears to have influenced the scores. Nevertheless the possibility remains that the ratings for either A-1 or Blue Line may not represent an unbiased assessment of those characteristics of the vehicle. However, the consistency of these results with data from other sources lends weight to these findings.

Figure 30/ Passengers Ratings of Vehicle Characteristics

Factor		All Passengers Avg	All Passengers Std Error	Lowered-Floor (Blue Line) Avg	Lowered-Floor (Blue Line) Std Error	Raised-Roof (A-1 Taxi) Avg	Raised-Roof (A-1 Taxi) Std Error
All passengers							
Cleanliness and state of repair of the vehicle	Total	8.54	0.014	8.28	0.19	8.95	0.19
	Non-Disabled	8.11	0.19	8	0.23	8.44	0.35
	Wheelchair	9.4	0.14	9.53	0.13	9.32	0.21
Seating arrangements	Total	8.68	0.017	8.41	0.24	9.18	0.18
	Non-Disabled	8.35	0.23	8.08	0.3	9.18	0.18
	Wheelchair	9.36	0.2	9.6	0.19	9.19	0.31
Smoothness of ride	Total	8.04	0.21	7.32	0.29	9.21	0.16
	Non-Disabled	7.34	0.28	6.88	0.34	8.67	0.3
	Wheelchair	9.41	0.15	9.07	0.3	9.63	0.13
Overall safety of vehicle	Total	8.8	0.015	8.63	0.2	9.07	0.23
	Non-Disabled	8.48	0.019	8.35	0.23	8.88	0.33
	Wheelchair	9.38	0.21	9.67	0.16	9.21	0.32
Overall comfort of the vehicle	Total	8.48	0.18	8.04	0.25	9.21	0.17
	Non-Disabled	7.99	0.25	7.71	0.3	8.87	0.34
	Wheelchair	9.49	0.13	9.4	0.21	9.54	0.16
Disabled Passengers							
Physically easy to get in and out	Wheelchair	9.06	0.21	9.07	0.33	9.06	0.27
Time taken to arrive after call	Wheelchair	9.03	0.24	9.07	0.36	9	0.34
Affordability for you	Wheelchair	8.19	0.37	8.29	0.53	8.08	0.55
Wheelchair location during the trip	Wheelchair	9	0.24	9.33	0.25	8.69	0.38
Security of wheelchair/scooter tie-downs	Wheelchair	8.97	0.26	9.4	0.21	8.5	0.45
Steepness of slope of the ramp	Wheelchair	8.08	0.43	9.4	0.31	7.2	0.6
Room for passengers to manoeuvre in the vehicle	Wheelchair	8.63	0.28	8.71	0.45	8.56	0.36

Source: Abt Associates Accessible Taxi Self Complete Questionnaire Question 7
Note: 'Boxed' ratings indicate that the average rating for that vehicle is higher and the difference is statistically significant.
Shading highlights the average ratings that fall below 8.00

The scores suggest that the A-1 raised-roof vehicle was preferred by non-disabled passengers and the Blue Line lowered-floor vehicles preferred by disabled passengers. The A-1 vehicle was preferred by non-disabled passengers in terms of its:

1/ seating arrangements

2/ smoothness of ride

3/ overall comfort

However, disabled passengers rated the A-1 raised-roof vehicle higher only in terms of its smoothness of ride.

On the other hand, non-disabled passengers did not give higher ratings to the Blue Line lowered-floor vehicle on any characteristic. However, it was rated higher by disabled passengers in terms of:

1/ wheelchair location during the trip

2/ security of wheelchair/scooter tie-downs

2/ steepness of slope of the ramp

Finally, the Blue Line lowered-floor vehicles achieved very low scores in terms of smoothness of ride and overall comfort. The A-1 raised-roof vehicles were given low ratings for the steepness of slope of the ramp.

6.6/ Maintenance Costs of Accessible Taxis

6.6.1/ Blue Line Taxis (Lowered-floor)

Blue Line uses a computer-based maintenance record system that shows all work done in the Blue Line shop. The research team analyzed those records for the lowered-floor vehicles operated by Blue Line and for a group of comparison vehicles.

According to reports from the drivers, vehicle #416 has not been reliable. It appears that some maintenance, particularly work done under warranty, is not recorded in the Blue Line system. It was off the road for about 10 days in mid-December and was in the garage repeatedly (twice per week for about three months) for starting problems that were finally corrected by replacement of the fuel injection system; and had major transmission work done outside warranty (the costs were compensated by Transport Canada under the agreement). The maintenance records show that, on the 30th of June, the Blue Line odometer reading for unit #416 was approximately 90,000 km. The maintenance records show a total of 30 work orders between January 1989 and 30th June 1990 (78 weeks), excluding fuel. The total cost for these (excluding fuel) was $4,882.55. Of the 30 work orders, four, totalling $165.36 were connected with taxi operation, e.g. taximeter installation or check.

One work order relates to the conversion. The rear springs were reinforced (an alteration to make the vehicle suitable for taxi work for a cost of $152.46). No costs are shown in the Blue Line records for any other work related to the conversion that may have been required. The balance spent on repairs and maintenance for the basic vehicle totalled $4,564.73. This can be broken down as per Figure 31.

These routine maintenance costs fall in a reasonable range for a taxi which is 18 months old and has travelled about 90,000 km. No one cost item is excessive. Further, the records suggest that the two vehicles have been reasonably reliable. The average number of repairs (W.O.'s) for vehicle #416 is one every 18.2 days (not twice per week as quoted by the drivers). None of the repairs carried out by Blue Line should have entailed long periods of time in the garage, unless parts were not available.

On June 30, the Blue Line odometer reading for unit #48 was 86,000 km (approximately). A total of 36 work orders were recorded between September 1988 and 30th June 1990 (95 weeks), excluding W.O.'s for fuel only. The total cost for these totalled $5,836.10. Of the 36 work orders, six were connected with taxi operation, e.g. taximeters, signage, etc., and one was for reinforcing the suspension springs. The expenditure on repairs and maintenance was $5,071 as summarized in Figure 31. The only exceptional cost is the

Figure 31/ Maintenance Costs for Blue Line Lowered-Floor Vehicles

	Maintenance Costs			
	Vehicle #48		Vehicle #416	
Category	Cost (approx.)	%	Cost (approx.)	%
Tires	$896	17.7	$572	12.5
Lub. oil & filters	741	14.6	692	15.1
Speedometer	83	1.6	310	6.8
Electrics	505	9.9	441	9.7
Cooling	20	0.4	237	5.2
Heating, A/C	792	15.6	254	5.6
Brakes	239	4.7	690	15.1
Steering/wheel align.	880	17.4	421	9.2
Exhaust	122	2.4	338	7.4
Transmission	116	2.3	133	2.9
Body (door hinge)	627	12.4	27	0.6
Miscellaneous others	50	1.0	450	9.9
Total	$5,071	100%	$4,565	100%

$880 spent on the fuel system (new pump). Otherwise the maintenance costs are reasonable for a taxi which is 22 months old and has travelled about 90,000 km.

The average number of repairs (W.O.'s) for vehicle #48 is one every 18.4 days. This is about the same as for vehicle #416. Again, none of the repairs should have entailed excessive garage time -- with the possible exception of the fuel pump problem.

In common with nearly all other taxi companies, Blue Line normally buys used vehicles for taxi service. To compare the maintenance costs of #48 and #416 with other taxis which were bought new, seven comparison vehicles were selected. Although these vehicles were bought new, their maintenance records only start in September 1988. In all cases the vehicles had already travelled significant distances, ranging from 47,000 km to 73,000 km. Therefore, the maintenance costs for these vehicles are not strictly comparable to the maintenance costs of the accessible taxis. However, if allowances are made for the differences in age of the conventional vehicles when the maintenance records begin, the comparison should indicate if the costs fall in the same range. Figure 32 shows the details.

The maintenance costs for the two accessible vehicles averaged about $56 per week, compared to about $77.50 for the conventional vehicles. Two of the seven conventional taxis show lower weekly costs than reported for the accessible taxis. These data lead to the conclusion that the routine maintenance costs for the accessible vehicles is at least comparable to the equivalent costs of conventional taxis.

6.6.2/ A-1 Taxis (Raised-roof)

Drivers report that one vehicle, #417, gave no problems except for the ramp which is difficult to stow. However, vehicle #50, accumulated a long list of problems. The vehicle was in the garage for 1 1/2 weeks for transmission work and the transmission "still doesn't work properly". The ramp is so badly damaged it is very difficult to use. Wiring problems attributed to the conversion (wiring was moved from the ceiling to the floor) required at least four trips to A-1's garage and three to an agency. The brake master boost cylinder has been replaced three times. When the vehicles were out of service for long periods, drivers

Figure 32/ Summary of Weekly Maintenance Costs

Vehicle Designation	Weeks of Service	Maintenance Costs	Weekly Maintenance Cost
Conventional Taxis			
#614	74	$3,450	$46.62
#601	78	6,307	80.86
#616	74	3,170	42.84
#639	78	6,953	89.14
#29	78	6,498	83.31
#445	78	6,717	86.12
#400	78	8,633	110.68
Average	76.86	$5,961	$77.56
Accessible Taxis			
#48	95	$5,071	$53.38
#416	78	4,565	58.53
Average	86.5	$4,818	$55.95

attempted to transfer to substitute vehicles. They were rarely successful. Because a back-up vehicle is seldom available, drivers have lost income during periods of downtime. One driver has sought compensation for two weeks of lost work during February and March. A further one week was lost by the night driver.

A member of the research team visited the owner of A-1 Taxi and discussed maintenance costs. He made copies of all his available records for the two accessible taxis in his fleet. The records are incomplete and therefore not useful for analysis. No other records are available.

6.7/ Conclusions with respect to the Demonstration Vehicles

The lowered-floor vehicle was generally preferred to the raised-roof vehicle. Disabled consumers, drivers, company official and the evidence of the ergonomic assessment all indicate that the lowered-floor design is superior to that of the raised-roof vehicle. However the raised-roof vehicles exhibited superior ride and general comfort for non-disabled passengers.

In the view of company officials and drivers, neither design represents a viable long-term solution to the need for an accessible taxi. The basic platform, a Chrysler van, is in their view, not sufficiently robust for a taxi service; and the standard of workmanship including rust protection, suggests that the vehicle conversion would have a short use life.

The routine maintenance and operating costs of the vehicle during the monitoring period, fell within the normal range for taxi operations. However, one vehicle of each type encountered numerous repairs and significant interruptions in service.

It should be noted that these comments apply to the two designs that were used in the demonstration. The observations and conclusions might not be sustained if the demonstration were repeated with vehicles currently available.

7/ THE DRIVER

Observations about drivers of the demonstration vehicles were gathered from a variety of sources including:

1/ Input on driver selection and training from representatives of the University of Wisconsin who were retained as advisors to the Transportation Development Centre.

2/ Observations from regular contact with the taxi companies.

3/ Attendance at driver training sessions and feedback from driver trainees.

4/ Reactions from drivers, communicated at quarterly driver meetings.

7.1/ Driver Selection

7.1.1/ Drivers Must Have the "Right Attitude"

Operators of accessible taxi services have made that point that driver selection is critical to the success of the service. Cook-Dupage Transportation Company, one of six door-to-door service providers in Chicago providing transportation to people with disabilities, has developed a number of criteria for screening potential drivers. The minimum age of drivers is 25; references are required; drivers must have an accident-free record and be able to pass a route examination and drug test; and they must have the appropriate attitude.

David Cyra, Director of Transportation Program, University Outreach, University of Wisconsin - Milwaukee reviewed the training program. He recommended, as part of his evaluation of the training for new drivers, that at least eight drivers be recruited for the demonstration. This option was never available to the demonstration. Both companies had difficulty recruiting and retaining drivers for the accessible taxis.

The accessible taxis in the Ottawa demonstration were operated by established taxi companies as part of the taxi fleet. They were driven by licensed experienced taxi drivers

who were recruited to drive the demonstration vehicles. Therefore, the initial selection was severely constrained, as compared to recruiting new employees to drive accessible taxis.

7.1.2/ Procedures for Recruiting Drivers

7.1.2.1/ Blue Line

Since Blue Line's drivers are unionized, it was necessary to clear the initiative to recruit drivers for the demonstration vehicles with union representatives.

The union raised no objections to the initiative, provided the terms of the contract were observed with respect to such things as seniority and conditions of work. The union stressed the point that drivers who opted to volunteer for the service would be allowed to transfer off the vehicles if they did not like the project . When drivers opted to return to conventional taxi duty, the union interpreted conditions of work to mean transferring to a vehicle "with the same features"; in this case, a new car with air conditioning. This proved problematic for Blue Line when one of the drivers was forced to transfer off the vehicle for tendonitis. It is not Blue Line's practice to use new, air-conditioned cars in taxi service.

Initially Blue Line had difficulty recruiting drivers for the accessible vehicles. Blue Line posted a notice indicating it was looking for drivers for the accessible vehicles. No-one volunteered. The general impression drivers received was that they would be driving disabled persons full time. Drivers reacted negatively. They were afraid they would lose money and, by and large, were not interested in driving disabled persons exclusively.

By mid-March 1989, Blue Line had identified only one driver who was interested in the accessible taxi. By mid-April, on threat of losing the contract for the demonstration project, Blue Line had lined up four drivers with the possibility of six. In short, it was less of case of recruiting drivers who met a particular selection criteria than of encouraging drivers who the company felt would be appropriate to volunteer; and there were few volunteers. The company could not hire outside the union to get drivers for the demonstration and it could not force the drivers to transfer onto the service.

Blue Line drivers assigned to the raised-roof vehicles became disenchanted very quickly. They lost income driving the vehicles and they refused to continue. Blue Line management agreed with their assessment and decided to withdraw these two vehicles from their service. In October, 1989, A-1 assumed operation of the raised-roof vehicles.

Drivers of the lower-floor vehicles continued with the project. For almost the duration of the project, however, these vehicles were single-shifted, for two major reasons

1/ The volunteers refused to continue with the project if they double-shifted the vehicles. They were unwilling to drive share a 4:00 a.m. to 4:00 p.m. work day.

2/ No-one else was willing to drive the vehicles.

After some delay, replacement drivers responded to a second call for volunteers but apparently without active encouragement from the company.

7.1.2.2/ A-1 Taxi

A-1 seems to have had less difficulty recruiting drivers initially than Blue Line, though it had similar problems retaining drivers. One of the difficulties is that it took three months to get the vehicles into service. Some of the drivers who initially expressed an interest, lost interest with the passage of time. The company points out that Ottawa has a surplus of drivers relative to the number of taxis.

One of the advantages A-1 seems to have had is that as a smaller company, it was better able to convince drivers to volunteer for the project. Also, A-1 had someone actively promoting the project throughout the demonstration.

One of the major concerns for drivers of these vehicles is that they retain their level of income. Given the voice-dispatched system at A-1, the company may have directed extra calls to the accessible taxis to offset any losses incurred through refusals and/or time lost serving disabled clients. From the drivers' point of view, there was more of an incentive to

become involved. But even here, numbers of volunteers were insufficient to allow the company to select from among volunteers.

7.1.3/ Motivating Factors

Whether the best candidates for the project were selected to drive the accessible taxis is a moot point. Insufficient numbers of drivers registered an interest for there to be any selection involved. By and large, drivers presented themselves and were accepted.

Drivers who volunteered to drive the accessible vehicles for the demonstration appear to have been motivated by a number of factors:

1/ The opportunity to drive a new vehicle.

2/ The opportunity to attract business over the slower summer months.

3/ The assurance they could return to driving conventional taxis if they lost income.

4/ Interest in providing a service to the community. Several of the drivers have family members who are disabled.

Towards the end of the demonstration, the involvement of drivers was more instrumental, a stop gap until they could transfer off the vans onto another vehicle. A number of drivers stated that they were driving the vehicle because, at least for the moment, they had no other option, the accessible taxi was available. In some cases, the driver was waiting to transfer off the vehicle. In others, the driver registered a willingness to drive an accessible taxi, in fact, indicated he would prefer to do so, "but not these vans".

These drivers were also more likely to mention the economy associated with driving these vehicles. From the perspective of previous owner-operators, the cost of operating these vehicles is an advantage.

7.2/ Driver Training

7.2.1/ Nature of the Training Provided

7.2.1.1/ Blue Line Taxi's Role

Drawing on its experience training drivers for its ParaTranspo contract, Blue Line assumed major responsibility for the training program.

Blue Line has developed a special training program for ParaTranspo drivers, which is provided through the Ottawa Rehabilitation Centre. The ParaTranspo program, which focuses on urban bus and para-transit operations, was seen by the company to be more extensive than that required for a taxi operation. Accordingly, Blue Line had the Rehabilitation Centre simplify the training package to a one-day training session combining classroom and on-the-road instruction.

This training package was supplemented with information from several additional sources: operators in Chicago, the University of Wisconsin, and the Ottawa Rehabilitation Centre.

7.2.1.2/ Training Inputs By Cook-Dupage Transportation

In February, 1989, a representative from the Transportation Development Centre visited Robert Jans of Cook-Dupage Transportation Company (CDT) to familiarize the project with its driver training program.

CDT has 170 drivers operating approximately 110 accessible vehicles and, at the time of the visit, had been invited by the Chicago Transit Authority to assume another service provider's contract. Driver training is an important component of CDT's success. Under the CDT system, drivers are given a five-day training course with 16 hours of sensitivity training and 24 hours of defensive driving. CDT provided the project with a compressed version of the five-day training course. This material was forwarded to Blue Line for incorporation into its training package.

On CDT's recommendations, Transport Canada funded a separate contract with Dave Cyra, Director of Statewide Transportation Programs, University of Wisconsin, for additional comment and advice on the training.

7.2.1.3/ Training Inputs By The University of Wisconsin

In mid-March, Dave Cyra met with members of Blue Line Taxi, the Ottawa Rehabilitation Centre, ParaTranspo drivers and the evaluation team. He observed a training session conducted by the Rehabilitation Centre for new ParaTranspo drivers. In his preliminary evaluation report, Cyra praised the staff of the Rehabilitation Centre and ParaTranspo drivers and suggested that they would provide valuable training to the accessible taxi drivers. Cyra also provided a package of available training material consisting of eight video cassettes and two four-inch binders, one for employee orientation, the other for the "professional driver". These materials were turned over to the demonstration project in April, 1989.

As a final deliverable, two of Cyra's colleagues attended a one-day session organized by Transport Canada in Ottawa on May 26, 1989. One of the purposes of this session was to provide additional training to the drivers to that provided in the April 26th session; the other was to "train-the-trainers".

7.2.1.4/ Ottawa Rehabilitation Centre Training Sessions

The Ottawa Rehabilitation Centre provided several training sessions for the drivers of the accessible taxis. The first of these training sessions was held at the Rehabilitation Centre on April 26, 1989 for four Blue Line drivers.

Unlike the approach adopted by Cook-Dupage or ParaTranspo, driver training was not highlighted at these sessions. These volunteer drivers were experienced taxi drivers with driving records known by the operator. Elements of driver training offered in other jurisdictions -- defensive driving, vehicle operation, use of radio, knowledge of the city

"routes and roads", etc. -- may be appropriate for drivers with less experience. The training provided by the Rehabilitation Centre was predominantly sensitivity and awareness training for the drivers. Driving tips were discussed in the sensitivity sessions and when the volunteer drivers were transported in the ParaTranspo vehicles to and from a shopping mall.

The material was presented in a participative style. Very little "lecturing" was used. The instructor acted as a facilitator rather than a teacher. The content was varied and practical and it held the students' interest.

Drivers got first-hand experience operating a number of wheelchairs and scooters. They were also able to speak openly with disabled volunteers about the experiences of disabled persons and their own experiences in the mall situation, where, as part of the training sessions, all four drivers went shopping in wheelchairs. Drivers were transported to and from a shopping mall in the ParaTranspo bus in wheelchairs.

All of the topics suggested by other operators for inclusion in a training session were covered in the first training session.

1/ Discussion of the attributes of the ideal driver/operator and the ideal customer/passenger.

2/ Discussion of the experiences of the drivers in being wheelchair-bound and how these experiences related to the "real" experiences of four volunteer disabled persons--one with a motorized wheelchair, two with push wheelchairs, and one on crutches.

3/ Presentation of the various ambulatory aids and a variety of scooters and both motorized and non-motorized wheelchairs. Drivers had an opportunity to try out a number of the scooters and chairs using a plywood ramp and step set-up in the meeting room. There were discussions of the various disabilities and mobility restrictions that are generally associated with the use of the various aids/chairs, the price associated with these items, and assistance techniques.

4/ Presentation of the various reasons for disabilities (diseases, injuries, amputation) and the limitations or restrictions imposed by each. Volunteers discussed their disabilities. The theme of what should be the role of the taxi driver and disabled riders became a topic of conversation. "What if" scenarios were discussed for the transportation of disabled passengers.

5/ Drivers and volunteers got some exposure to the accessible vehicles. Various techniques were tried with a number of wheelchairs/scooters. A lot of discussion occurred about the vehicles and the best methods to assist entry, exit and positioning of passengers in vehicles.

The arrival of the press at the afternoon session limited the drivers' exposure to the vehicles and the opportunity to practice entry, exist and tie-down procedures. The effect was evident at the second training session on May 26th (the session organized by Transport Canada) when it was discovered that one driver was unfamiliar with the tie-down mechanisms of his vehicle.

A second training session was held at the Rehabilitation Centre on October 20, 1989 for four volunteer drivers and two dispatcher/drivers from A-1 Taxi. This session replicated the training session provided on April 26th. The morning session was devoted to in-class presentations to sensitize drivers to the needs of disabled passengers. Topics covered include myths and facts surrounding disabilities, type of disabilities and kinds of problems encountered, types of aids and possible driver support required. The afternoon session began with a demonstration of wheelchairs, provided an opportunity to practice assisting disabled passengers to enter and exit the vehicle and allowed the trainers to ride in the vehicles as "disabled" passengers.

As a result of driver turnover, a third training sessions was held at the Rehabilitation Centre on May 7, 1990 for new drivers from both taxi companies.

7.2.2/ Assessment of the Training Provided

7.2.2.1/ University Of Wisconsin Input

The training session organized for May 26 1989 was organized into two parts. The morning session focussed on training for drivers; the afternoon session was oriented towards the training requirements of trainers. The morning session was useful, but not directly concerned with training. Most of the morning was spent discussing drivers'

experiences with the vehicles to date. It was only towards the end of the morning session that the issue of training was briefly addressed through a series of questions and answers:

1/ "What type of training did you find most effective?"

2/ "What would you recommend in the way of training?"

3/ "What else does a new recruit need to know?"

The afternoon session for trainers was of doubtful value. The train-the-trainer session could have been conducted just as effectively by any one of many Canadian training organizations. It was not aimed specifically at the training of drivers of disabled passengers. The handout, "Train the Trainer Basics" is very condensed -- two of its four and a-half pages consist of a logistics checklist. Any competent trainer already knows virtually all of this material. Much of it is "motherhood".

7.2.2.2/ Ottawa Rehabilitation Centre Training Sessions

In a wrap-up session following the training, drivers and volunteers discussed their experiences. An evaluation form was distributed and filled out by the drivers. In general, drivers were satisfied with the training they received. Future training sessions should consider these suggestions:

1/ While there is general satisfaction with the training, drivers felt they should receive more hands-on experience assisting disabled passengers to enter and exit the vehicle, something that was denied the first group due to the intervention of the press. Videos are not sufficient. Assisting entry and exit is a very different experience from working with the chairs in a classroom setting.

2/ Problems with tie-downs arise as a result of the range of chairs used. Drivers estimated that it might take 15 to 30 minutes to tie down a unfamiliar chair the first time. Drivers got a lot of experience tying down various types of chairs as a result of the ergonomic evaluation. This type of practical experience is something that should be included in the training package.

3/ During the ergonomic evaluation, drivers were observed to be following inappropriate lifting procedures. Along with a session on the "dos" and "don'ts" of loading and unloading wheelchairs, the training session should cover: proper lifting procedures, to

minimize risk to the driver and passenger and tips on how to reposition the chair if the driver runs the wheels off the ramp.

4/ Differences in driving style are important to the comfort of the ride. Some thought should be given to covering the defensive driving component of the Cook-Dupage course in future training sessions.

5/ The intimacy of the relationship between driver and rider in the tie-down procedure is disturbing to some riders. There are ways to do the tie-downs and minimize rider contact. This needs to be covered in the training session.

6/ Individuals in scooters are required to transfer to the seat. Drivers have been intimidated by passengers who wish to ride in the vehicle, in their scooter, "tied down as best they can". One driver went so far as to allow the passenger to travel unrestrained. Appropriate policies should be developed to address this situation and discussion of the policies should form part of the training curriculum.

7/ Drivers have concerns about the liability of the driver and/or the company, when transporting a disabled passenger. This topic should be covered in the training sessions.

Also, there is a need for on-going training. At one stage of the demonstration, when it was found that new drivers were operating the vehicles with no instruction beyond that provided by other drivers, further training sessions were provided. Having untrained drivers operate the service is not acceptable.

The lack of driver training in the raised-roof vehicles was apparent during the ergonomic assessment. Passengers were taken down the ramp facing forward. Tie-downs were put on backwards (i.e., rear tie-downs were placed at the front). Tie-downs were not properly fastened and provided no actual support (e.g., the tie-downs on a scooter fell off during transit). In addition, female passengers reported that the drivers of the raised-roof vehicles were either "sitting in my lap" or "touching too many of my parts". Finally, no training had been given in proper lifting procedures for loading and unloading wheelchairs. The following is an example of problems arising from this.

On one occasion, the ramp on one of the raised-roof vehicle did not come fully out. The driver had to work exceedingly hard to deploy it as far as he did. The failure to fully deploy the ramp prevented him from raising the side-guards on the lower portion of the ramp. The driver of the vehicle said that he rarely used the side guards: "My aim is good."

He subsequently attempted to load a passenger in a lightweight chair with the following results: the chair hit the edge of the lip and was brought to a halt. The passenger lurched forward, but did not fall out of the chair. In a subsequent try, the same driver almost pushed the chair over the side of the ramp in that section where the side-guard could not be raised. Further along the ramp, the driver momentarily lost his footing, emphasizing the need for non-skid ramp covering. The passenger was subsequently unloaded facing forward and was almost pushed over the side of the lower end of the ramp where the side-guard could not be raised. The driver said that he had never found a use for the side-guard at the far end of the ramp.

On a subsequent loading, the chair was again halted at the outer lip, and again at the lip adjacent to the vehicle. The driver again slipped when coming up the ramp.

Stowing the ramp in the raised-roof vehicle was difficult. The lower side-guard was bent out of position. The driver banged it several times with his fist to get it to pass into the channel allowed for the inner ramp. The driver had to complete the stowage by pushing with his foot.

7.2.3/ Summary

The "Training Basics' Themes" handout presented by the University of Wisconsin at the May 26th session provides a reasonably detailed curriculum for a training course for drivers of disabled passengers. Its content is extremely similar to the training actually given to drivers by the Rehabilitation Centre. Therefore, based on the curriculum content, direct observations, and comments from the drivers, the training sessions provided by the Rehabilitation Centre appear as well designed and as effective as any available elsewhere. Importing "specialized" trainers from outside the Ottawa area (for training in the Capital region) would not appear necessary or appropriate. The training provided by the Rehabilitation Centre and by Blue Line should provide the basis for training drivers of accessible taxis in other parts of Canada. The training should, however, be supplemented as discussed above.

7.3/ Driver Reactions to and Experience with the Demonstration, this Type of Service Vehicle, Disabled and Non-disabled Passengers

The research team met with drivers quarterly to access their reactions to the service and to get first-hand reports on the service and the vehicles from the point of view of the drivers. The following summarizes reactions to the service garnered over the period of the demonstration.

7.3.1/ Driver Reactions to the Service

Driver reactions to the vehicle have been discussed. This section will focus on service aspects.

The drivers were initially very enthusiastic about the service. Some of the volunteers have disabled family member. They saw the demonstration as a way of providing a service to the community. However, during the course of the demonstration, all of the drivers except one, transferred off the service. Some drivers left for medical or health-related reasons. Others, however, left due to frustrations stemming from:

1/ The constant demand to explain the purpose of the vehicle to every passenger who rode in it.

2/ The added inconvenience of keeping a log for purposes of the demonstration.

3/ The added time spent serving disabled clients with no offsetting benefit to the drivers.

Towards the end of the demonstration, the theme of income loss came up in the discussions. The amount of time spent assisting riders varies according to a number of factors: size of the chair, experience with the chairs, and whether you include the time assisting riders to and from the vehicle. Drivers estimated that the time required to assist riders, particularly when you include time waiting and time assisting riders from their front door to the vehicle and back -- even when the driver has experience with the tie-downs -- was running in the neighbourhood of 12 to 15 minutes for each passenger. Considered against a non-disabled passenger who is usually moving toward the sidewalk to lessen the amount of time involved, and depending on the number of fares involved, drivers estimated that they might lose up to 20 minutes an hour while serving disabled passengers. Driving the vehicle was perceived to "cost them time and money".

This led a number of them to suggest that drivers of accessible taxis should be "treated differently from other drivers"; that they should be given some additional form of compensation -- be paid for 100% of the time involved in providing the service, including charging the passenger for time spent waiting; being put "first up" after a "disabled" call; or other arrangement (unspecified by the drivers) to compensate the driver.

4/ Concern over the issue of liability, if there were an accident, along with the potential for injury to the driver assisting a passenger in a wheelchair.

5/ Concern over the look and ride of the vehicle. This was particularly problematic for the raised-roof vans.

6/ Vehicle downtime. Two of the vehicles (one of each version) had long periods when they were out of service for maintenance. Drivers can sometimes transfer onto another vehicle, when one is available. This was not always possible here. As a consequence, drivers lost income during the downtime.

The drivers of the Blue Line vehicles were always sensitive to the fact that they were unable to service the demand generated with the vehicles available. From the beginning, they expressed concern that they were, in their view, unfairly targeted for criticism for their performance in this regard.

7.3.2/ Promotion of the Service

The question of promotion generated a lot of discussion at both the drivers' quarterly meetings and the Advisory Committee meeting held on December 14, 1989 to acquaint Committee members with the objectives of the demonstration and to obtain feedback to the project Steering Committee.

By default, drivers became responsible for most of the promotion for the service. In some cases, they assumed this role with enthusiasm and became "goodwill ambassadors" for the project. In others, they clearly found the role intrusive; and it became one of several factors that convinced them to withdraw from the project.

In the view of the drivers, more needed to be done in the way of promotion. The majority of the promotion tended to be with disabled riders. Drivers advocated direct advertising

that would promote its use by everybody and indirect advertising with the dispatcher taking a more proactive role, informing riders about the service. It should be noted that, since the demonstration had difficulty servicing the demand generated, the Project Steering Committee was reluctant to engage in a major promotional campaign that would raise expectations. Any increase in demand increased the likelihood of more refusals and more negative publicity for the project.

7.4/ Conclusions with Respect to Drivers

Both companies had significant problems recruiting and retaining drivers for the accessible vehicles. Throughout the period of observation, the nature of the demonstration introduced additional frustrations for the drivers in explaining and promoting the service. However, the experience gained in the demonstration confirms that close attention should be paid recruiting and retaining drivers who are well suited to operating accessible vehicles.

The training package used in the demonstration appears to be generally satisfactory. However, there appears to be a need for ongoing reinforcement of the training. Of even greater concern is the evidence from the trial that drivers with no training in use of tie-down or assistance to disabled passengers, were allowed to operate the accessible vehicles. This practice should not be allowed.

8/ THE PASSENGER

The information set out in this chapter was developed principally from these sources:

1/ Baseline survey of the disabled in Ottawa.

2/ Diaries maintained by 19 test riders recruited from Ottawa's disabled community and regular contact with test riders.

3/ Self-complete questionnaire completed by 150 passengers in the demonstration vehicles.

User reactions to the accessible taxis are important from a policy point of view. An assessment of community acceptance requires information from a variety of sources; principally, disabled and non-disabled riders of the accessible taxis. Community acceptance should also be examined in the context of other services. It should compare satisfaction ratings by disabled riders for accessible taxis and other accessible transportation alternatives. As well, it should track changes in the travel patterns and, ultimately, in access to the community of disabled consumers, pre- and during the trial period for accessible taxis.

This chapter addresses both the specific reactions to the service and vehicles involved, as well as the more general reactions that may include impact on travel patterns and access to the community.

8.1/ Disabled Passenger Characteristics

8.1.1/ Baseline Survey

Chapter 3 and Appendix B summarize the design and implementation of the baseline survey. Considering all respondents together, the following summarizes the general characteristics of those who qualified as disabled:

1/ The majority of respondents (88%) are mobility/agility impaired. The vast majority of respondents use assistive devices, including:

- Wheelchair or scooter, used by 65 respondents (45%), 80% of whom "always use a wheelchair".
- Cane, used by 30% of respondents. About one-half use the cane "occasionally". The remainder "always" use it.
- Walker or crutches, used by 14% of respondents. About 40% use these aids occasionally. The majority "always" use them.
- None of the respondents use a guide dog. Only three use a white cane.
- Of those using a wheelchair, three-quarters are able to transfer to the seat of a vehicle, and of those who can transfer, 60% can transfer alone. The remainder need assistance.

2/ As expected, virtually all respondents (92%) had taken trips (excluding "walking" trips) outside their home in the last year. This group reports that they are able to use modes of travel as follows:

- Travel in a private vehicle as a driver (29%).
- Travel in a private vehicle as a passenger (86%).
- Travel by OC Transpo (conventional bus) (17%).
- Travel by ParaTranspo service (66%).
- Travel by conventional taxi service (52%).

3/ About one-quarter of respondents (26%) report they cannot travel as much as they would like, and over half (55%) have trouble getting in and out of most vehicles. Only 11% are not eligible for ParaTranspo.

4/ About one-quarter of respondents (24%) were employed during the last month. Most were employed full-time. Of those who are not employed, about 27% were unemployed or laid off.

5/ Finally, exactly half of the respondents (72 individuals) agreed to act as trial riders for the demonstration.

The survey findings with respect to potential demand for an accessible taxi service in Ottawa are reported in the following chapter.

8.1.2/ Test Rider Results

An outline of the overall approach to developing test riders information is provided in Chapter 3. Appendix D contains examples of the forms used. Detailed tables of results are contained in a separate volume of this report.

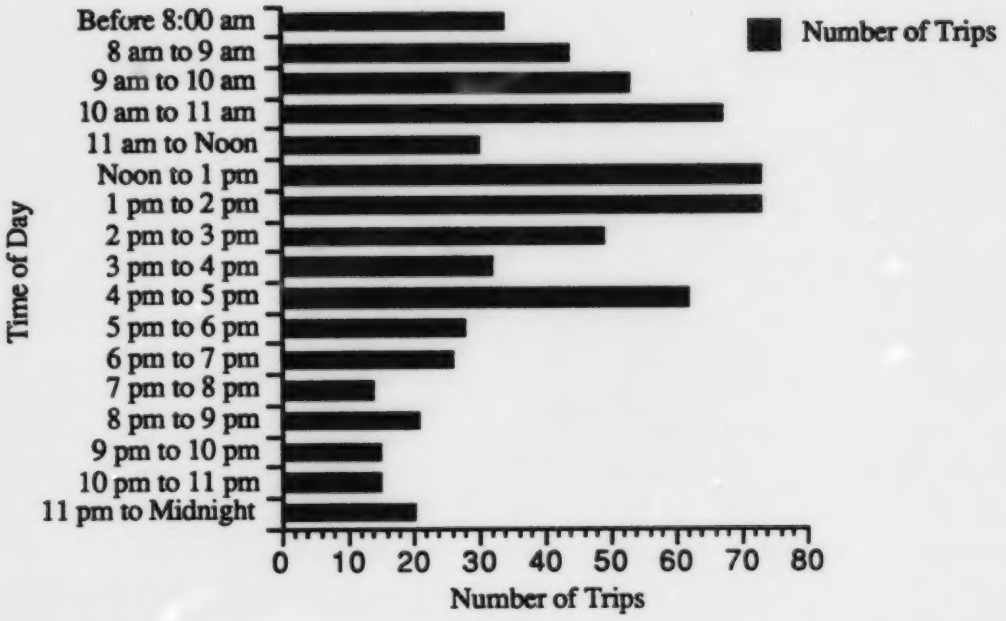
The first observation about test rider diaries reflects the nature of the trial. Since only four vehicles were operating (one or two shifts per vehicle) in a community served by over 1,000 taxis, the accessible vehicles were seldom available when called. An analysis of the trips taken by test riders shows a total of 702 trips, only 24 of which were taken by accessible taxis. Because A-1 Taxi allowed pre-booking of its accessible vehicles, that company accounted for the largest share of the accessible taxi trips, 19 out of the 24.

Test riders confirm that the A-1 raised-roof vehicles were easier to get. Test riders were, in the main, unable to obtain an accessible taxi from Blue Line. Test riders who called in unsuccessfully were generally told "the taxis were not operating", were "not on the road" or that they were "unavailable". Reports from the community confirm this. The lower-floor vehicles were seldom available.

Because of the limited availability of accessible taxis, the time of day of trips taken by test riders reflects the pattern that is normal with the currently available accessible transportation resources in Ottawa. Figure 33 shows that the bulk of trips are taken between 8:00 a.m. and 5:00 p.m. Fewer trips are taken in the evening. An examination of the time of trip for the accessible taxis suggests that travel during the evening is relatively more frequent with the accessible taxis than with other modes of transportation. This observation is confirmed by comments from the test riders. They report that use of an accessible taxi allows them to make trips they otherwise would not attempt -- giving persons with disabilities better access to the community. However, because of the limited number of vehicles available in the demonstration, test riders were reluctant to rely on accessible taxis because most often they are not available. The propensity to use accessible taxis will improve substantial, should they become more numerous in Ottawa's taxi fleet.

Test riders reported the main purpose of each trip they took during the reporting period. The diary allowed the test riders to report multiple trips for each time away from home, thereby coding the purpose for each segment of a trip. For example, a trip to work, then to shopping and then home would be reported as three separate trips. The purpose of trip reported by test riders as summarized in Figure 34.

Figure 33/ Time of Day of Trips by Test Riders


Number of Trips
Time of Day
Before 8:00 am
8 am to 9 am
9 am to 10 am
10 am to 11 am
11 am to Noon
Noon to 1 pm
1 pm to 2 pm
2 pm to 3 pm
3 pm to 4 pm
4 pm to 5 pm
5 pm to 6 pm
6 pm to 7 pm
7 pm to 8 pm
8 pm to 9 pm
9 pm to 10 pm
10 pm to 11 pm
11 pm to Midnight
0 10 20 30 40 50 60 70 80
Number of Trips

Source: Abt Associates Test Rider Trip Diary, Question 1.

Figure 34/ Summary of Purpose of Trip for Test Riders

Purpose of Trip	Share of all Trips (n=702) %	Percent Of All Accessible Taxi Trips (n=24)
Go to work	7.7	4.2
Other personal business (bank, etc.)	8.0	4.2
Shopping	10.7	20.8
Medical facilities	5.6	12.5
Leisure/recreation facilities	9.8	12.5
Visit friends, relatives	4.8	0
School	3.0	0
Airport, train station, bus depot	0.3	0
Return home	42.5	41.7
All other mentions	2.8	4.2
Don't know/not stated	0.3	0

Source: Abt Associates Test Rider Trip Diary, Question 2.

The majority of trips were taken using ParaTranspo which accounted for 55.7% of all trips reported by test riders. The distribution of mode is shown in Figure 35.

For each trip, the test riders indicated their reason for selecting the mode of transportation that was used. The questionnaire allowed multiple mentions since more than one reason could apply to a given trip. Considering all responses, the dominant reasons were habit -- would usually use this type of transportation -- which applied to almost two-thirds of trips; and low cost, which applied to about half of trip. Details are shown in Figure 36.

The figure also shows the equivalent results for the trips taken by accessible taxi. Although the total number of trips is low, the reasons given are instructive. First, because an economic incentive was paid to test riders to compensate them for the effort involved in completing the diary, about one-third of the trips taken in the accessible taxi show the reason "the economic incentive provided meant I could afford accessible taxi". Therefore some share of the trips were experimental and not indicative of typical use. On the other hand, "convenience of not having to book in advance" and "availability" are reported much more frequently for accessible taxi than for all trips taken together. Note that use of ordinary taxi and riding as a passenger in a private vehicle show about the same ratings as reported for accessible taxis.

The test riders reported the incidence of being accompanied on a trip in an accessible taxi. The results show that on almost half of all trips taken by the test riders, the test rider was accompanied by another passenger. In one case the disabled rider was accompanied by another disabled passenger. In all other cases, they were accompanied by non-disabled riders, six examples of a single fellow passenger and one example of three fellow passengers.

All test riders required some assistance entering and exiting the accessible taxi. Overall, the test riders estimate the drivers spent about 5 1/2 minutes assisting the passenger into the vehicle. This estimate begins when the vehicle arrived and ends when the driver was back in the driver seat. Similarly, test riders estimated that drivers took about 4 1/4 minutes assisting them out of the vehicle. This counts the time from arrival of the vehicle at the destination until the driver was back in the driver seat. In about two-thirds of trips, test

Figure 35/ Mode of Transportation Used by Test Riders

Mode of Transportation	Percent of Trips (n=702)
Accessible Taxi (Raised Roof)	2.7
Accessible Taxi (Lowered Floor)	0.7
Ordinary Taxi	2.4
Conventional OC Transpo Buses	7.1
Private vehicle, as a passenger	18.2
Private vehicle, as a driver	7.3
ParaTranspo	55.7
All other mentions	0.1
Not stated	1.1

Source: Abt Associates Test Rider Trip Diary, Question 3.

Figure 36/ · Reasons for Selecting the Mode of Transportation Used for each Trip

Reason for selecting particular mode of transportation	Percent of trips (n=702)	Percent of All Accessible Taxi Trips (n=24)
It was available (no one was using the car, the taxi was sitting idle, etc)	7.4	25.0
I was curious/ I wanted to try the accessible taxi	0.3	8.3
The economic incentive provided meant that I could afford the accessible taxi	1.7	37.5
It was the most convenient alternative available at the time	23.2	45.8
I didn't have to book in advance	13.7	37.5
I would usually use this type of transportation for a trip of this type	64.8	4.2
There were no alternatives available	9.5	8.3
It is cheaper than the other options available to me	50.1	0
Already made a booking (return booking)	0.4	0
Taxi (accessible) not available	3.4	0
All other mentions	5.8	0
Don't know/not stated	0.1	0

Source: Abt Associates Test Rider Trip Diary, Question 4.

riders travelled in a wheelchair and on the balance of trips occupied the standard vehicle seats.

Almost half of the test riders reported that they would not have made the trip if the accessible taxi had not been available. For those who would have used an alternative method of transportation, about half of the trips would have been taken with the test rider driving a private vehicle and the remainder would be equally divided between travelling as a passenger in a private vehicle and using an ordinary taxi. In only one case would the trip have been taken with ParaTranspo. These data suggest that use of accessible taxis will have minimal effect on ParaTranspo and may displace some share of trips currently taken by ordinary taxis. On the other hand, the data suggest almost half of the trips taken in the accessible taxis by disabled passengers represent an expansion in the total number of taxi trips in the community. As well, 40% of trips made with disabled passengers represent trips that otherwise would not have been taken. In other words, it appears that accessible vehicles substantially improve the access to the community that is available to the disabled.

8.2/ Reactions of Users of the Accessible Taxis

Chapter 3 describes the methods used to gather information from passengers in the accessible taxis through a self-complete questionnaire. The questionnaire is reproduced as Appendix E.

Because of the method used to distribute the questionnaires, these results should not be taken as statistically representative of passengers using accessible taxis. For example, it appears that disabled passengers were more likely to be asked to complete questionnaires than non-disabled passengers. However, it appears that the responses from passengers can be taken as a fair indication of passenger data for non-disabled and disabled passenger, taken separately.

8.2.1.1/ How Passengers Came to Use the Accessible Taxis

Figure 37 summarizes how non-disabled, wheelchair and ambulatory disabled passengers came to use the accessible vehicles. As expected, the vast majority of wheelchair and scooter users telephoned for the accessible taxi (89%). Non-disabled passengers generally telephoned for a taxi (71%) but 20% of all non-disabled passengers picked up the accessible vehicle at a taxi stand. As noted above, Blue Line controls most of the taxi stands in Ottawa. A closer examination of these data shows that all of the non-disabled passengers who picked up the taxi at a stand used the Blue Line vehicle, accounting for about 23% of all fares for the Blue Line accessible taxi.

Figure 37/ How Passengers Came to Use the Accessible Taxis

How the Passenger Came to Use the Accessible Taxi	Percent All Respondents (n=150)	Percent Non-disabled (n=97)	Percent Wheelchair/ Scooter User (n=45)	Percent Ambulatory (n=3)
Telephoned for Accessible Taxi	30	4	89	33
Telephoned for Taxi	51	71	11	67
Hailed it	3	5	0	0
Picked it up at a Taxi Stand	13	20	0	0
Not Stated	3			

Source: Abt Associates, Accessible Taxi Self-complete Questionnaire, Question 2.

8.2.1.2/ Consequences if Accessible Taxi had not been Available

The questionnaire asked passengers if they would have made the trip, had the accessible taxi not been available and if so, what alternative mode of transportation would have been used. Responses to these questions confirm the data from the test rider diaries. Exactly one-third of wheelchair-users and ambulatory disabled passengers would not have made the trip if the accessible vehicle had not been available. For those who would have found an alternative mode, the most likely method would have been an ordinary taxi, ParaTranspo or using the wheelchair/scooter. These results contrast sharply with the responses of non-disabled passengers. Only 8% of non-disabled passengers would not have made the trip had the vehicle not been available. The vast majority (90%) would have used an ordinary taxi.

8.2.1.3/ Other Passengers

The self-complete questionnaires indicate that disabled passengers are more likely than non-disabled passengers to be accompanied by another rider. Figure 38 shows that about 70% of non-disabled passengers travelled alone and the majority of those who travelled with another person had one companion. Users of a wheelchair or scooter travelled alone 54% of the time. Other non-disabled riders accompanied the disabled rider on about 13% of the trips, on two occasions with four non-disabled companions. In one instance, one disabled rider accompanied the questionnaire respondent and in another instance, two disabled companions (not necessarily using wheelchairs) accompanied the respondent. These results indicate the importance of suitable accommodation for both disabled and non-disabled companions in an accessible taxi.

Figure 38/ Incidence of Being Accompanied on the Trip in the Accessible Taxi

	Percent All Respondents (n=150)	Percent Non-disabled (n=97)	Percent Wheelchair/ Scooter User (n=45)	Percent Ambulatory (n=3)
Travelled alone	63	72	53	0
Travelled with Attendant	7	2	20	0
Travelled with another Disabled Rider	2	1 (One) 1 (Two)	2 (One) 2 (Two)	0
Travelled with other non-disabled riders	9 (One) 2 (Two) 1 (Four) 1 (Five or more)	9 (One) 2 (Two) 1 (Five or more)	7 (One) 2 (Two) 4 (Four)	67 (One) 33 (Not Stated)

Source: Abt Associates, Accessible Taxi Self-complete Questionnaire, Question 5.

8.2.1.4/ Willingness to Use the Accessible Taxi Again, Summary Comments

The vast majority of passengers (144 of 150) would use the accessible vehicle again. And even among those who indicated they would not use the accessible taxi again, the reasons are quite positive. Among A-1 passengers the reasons were:

1/ "No need."

2/ "Since I am non-disabled, it should be reserved for the handicapped." This same passenger commented that "the kids loved it!".

Among Blue Line passengers who indicated they would not use this service, the reasons were:

1/ "uncomfortable".

2/ "noisy".

The self-complete questionnaire allowed respondents to record their general comments by including a final question "We would appreciate any other reactions or comments you may wish to offer". The responses are shown in Figure 39.

Over half of Blue Line passengers took this opportunity to provide additional comments; 57 comments were coded from 47 respondents. Thirty of 68 A-1 passengers offered comments, with a total of 40 comments. Individual comments are largely positive with the largest group category as "great idea" or "like it". Some of the verbatim responses in this category offer insights into the nature of passenger responses. For example:

1/ "Reminds me of a London cab. I like it!"

2/ "Blue Line has to be commended for providing this much needed service."

3/ "Upright seating, large doors, walk-in access."

4/ "Working with various organizations relating to persons with disabilities, I highly appreciate the fact that accessible taxis are available. I will mention this to my associations when they are in Ottawa for meetings (five times a year)."

Figure 39/ Summary of Other Reactions or Comments

Other Reactions or Comments	Blue Line (Lowered-Floor Vehicles)				A-1 (Raised-Roof Vehicles)			
	Non-disabled	Wheelchair/ Scooter User	Ambulatory	Would use the Accessible Taxi Again	Non-disabled	Wheelchair/ Scooter User	Ambulatory	Would use the Accessible Taxi Again
Positive Mentions								
Great idea/Liked it	18	2	0	20	6	6	0	9
Comfortable/ Pleasant ride	4	1	0	5	2	0	0	1
Lots of room for passengers	10	0	0	11	2	0	0	2
Driver courteous/Friendly/ Helpful	5	3	0	3	4	7	0	11
Other Mentions	4	0	0	3	5	4	0	9
Negative Mentions								
Service unavailable/ Busy	0	2	0	2	0	1	0	1
Stability of rear of vehicle should be improved	1	0	0	1	0	0	0	0
Other Mentions	4	1	0	5	2	1	0	3

Source: Abt Associates, Accessible Taxi Self-Complete Questionnaire, Question 9.

5/ "Excellent idea. I completely support the use of this vehicle."

6/ "Whether or not you are handicapped, accessibility is important."

7/ "A larger vehicle should be used for its smoother ride. This type of taxi is a terrific idea. Keep improving and Blue Line might be liked as a taxi company. Too many of your cars are in bad shape and very dirty."

8/ "I like the 'accessible' nature of the vehicle, ease of getting in and out, roominess etc. even though I am not handicapped."

Before the demonstration began, the taxi operators were cautious that some passengers might not approve of the vehicle and as a result might shift their business to another taxi operator. The evidence from the self-complete questionnaires indicates that the positive reactions of riders far outweigh any negative responses. Indeed, operating an accessible service would appear to be good public relations, improving the image of the taxi operator in the eyes of non-disabled passengers.

8.2.2/ Driver Reports of Reactions of the General Public

The drivers of both versions of the van encountered a range of passenger responses, from extremely positive to extremely negative. In the main, the reactions of riders were "very positive". Some non-disabled riders were initially reluctant to use the service. If they could be enticed into the demonstration vehicles, the drivers were, purportedly, able to "convert" them to the service.

Drivers of the lower-floor vehicle found that well-dressed, female professionals - young to middle age - were initially reluctant to use the vehicles. In the view of the drivers, these passengers "don't want to look funny". This is changing, however. Towards the end of the demonstration, these women had become "converts to the service". They appreciate the ease of access to the vehicle and had, reportedly, taken to flagging down the vehicles.

Overall, reactions to the raised-roof vehicles were similar - a range of responses - overall, positive, but with regular complaints "every night". The major barrier, especially for the raised-roof vehicles, was recognition -- potential passengers recognizing that this is a taxi

for everyone, non-disabled and disabled alike. Drivers report that some riders were offended when the vehicles arrived at their door. **"This is a truck!"** Other reactions encountered include:

1/ "Why are you picking me up in this, I'm not handicapped?"

2/ "Why did you send me this? It's a van. **I want a taxi.** Send me a taxi."

3/ "I don't need anything this big!"

Drivers report some outright refusals. One driver of the raised-roof vehicle reported an occasion when the vehicle arrived at an apartment and when the clients saw the van, "they wouldn't come out." However, towards the end of the demonstration, drivers felt the situation had improved. They were getting "a lot of repeat fares". Flag-downs, which had been a problem from the start, were getting better for the lower-floor vehicles. There was still, however, a tendency for riders to refuse the vehicle at a taxi stand since many people did not recognize the accessible vehicles as taxis.

8.2.3/ Comments from Driver Logs

While there may be some opportunity for selective reporting by drivers, the logs provide insight into passenger reaction. Drivers of the accessible vehicles completed logs recording details of their patterns of trips and any comment. The recording took place from December 1989 to June 1990 -- the last seven months of the trial. The "comments" section of the driver logs indicate an overwhelmingly positive support for the accessible vehicle. One driver for A-1 Taxi recorded comments for most fares during December. With over 100 comments recorded, only a handful could be considered negative. Four people found the vehicle "strange" and about an equal number described it as "different". The balance were strongly supportive: "needed", "good to have", "useful", "great headroom", "required vehicle", "good idea", "necessary", all occurred frequently.

The driver logs also provide insight into the actual rate of refusal experienced by the demonstration vehicles. Of 5,619 trips described in the logs, two fares for A-1 raised-roof

vehicles and one Blue Line (lowered-floor vehicle) fare were described as "Refused van". This result can be compared to 56 trips coded as "no load". Therefore, the data indicate that, while noticeable in the context of the demonstration, the actual prevalence of refusal is very low.

In summary, the vast majority of users of the accessible taxi were very favourably impressed by the concept; and some were specifically favourable about the vehicle.

8.2.4/ Driver Reports of Reactions of Disabled Riders

Throughout the course of the demonstration drivers expressed concern that they were not carrying more disabled passengers. They were clearly disturbed that there was not more promotion of the service. Riders were generally unaware of the service. Many disabled riders did not even know about the service. This was confirmed in the Advisory Committee meeting.

Those disabled riders who used the service reportedly "love it". Disabled riders who were involved in the ergonomic assessment expressed a preference for the lower-floor vehicle because it "didn't look like a handicapped vehicle" and "it didn't make them feel different." A couple of people using crutches stated a preference for the high-roof vehicle because they "didn't have trouble bumping their head".

Drivers understand clearly that cost is a major factor for disabled riders. They appreciate that a taxi at full commercial fare is quite expensive for most disabled riders. Drivers anticipate that the use of the vehicles would increase substantially if some sort of subsidy were available to reduce the fare paid by disabled passengers.

8.3/ Complementary Services

ParaTranspo accounts for about 1,500 trips each weekday and about 500 trips on Saturday and about 400 on Sunday. At peak, its has 53 vehicles on the road, including a mix of cars

for the ambulatory-disabled, vans for ambulatory and wheelchairs, and Orions (kneeling buses).

About 50% of the passenger trips involve passengers confined to wheelchairs. If a doctor indicates that an attendant must accompany the rider, the attendant is given a special identification badge and is allowed to travel free, the only non-disabled passengers allowed to use the service. Attendants accompany about 6% of disabled passengers.

While about 7,000 users are registered, the number does not represent the typical profile of use. About 50% of the typical daily trips are"regular"--booked in advance every week for that time--often a trip to work (perhaps 700 daily users). Other trips are booked in advance, calling one morning for a trip the next day. About 3% of booked calls are "no shows" and 7% of trips booked in advance are cancelled.

The ParaTranspo operation requires a doctor's certificate before it will carry a passenger. Passengers purchase a monthly pass equivalent to the OC Transpo pass. The regular users who buy the pass use it, typically, 33 times a month compared to about 50 times a month with the OC pass.

8.4/ Conclusions with Respect to Passengers in the Accessible Taxis

The experience of test riders with the demonstration vehicles confirms that this service has the potential to substantially improve access to the community for disabled persons.

Self-complete questionnaires and anecdotal evidence from drivers indicate that passengers in the accessible vehicles strongly support this service. The principal source of complaint about the vehicles stems from a lack of understanding of its intended use, serving both non-disabled and disabled customers. With improved publicity for the service and a higher proportion of accessible taxis in the total fleet, this reaction should quickly diminish. However, even during the demonstration, the companies offering the accessible service appear to have gained far more in good public relations than they might have lost from the occasional disgruntled passenger.

The peak use of accessible vehicles by disabled passengers occurs during a relatively slack period of use by non-disabled passengers. Therefore, the service is complementary to taxi use by non-disabled passengers, raising the possibility of improved utilization of accessible vehicles as compared to conventional taxis.

9/ ECONOMIC ASSESSMENT

The information presented in this chapter was developed primarily from these sources:

1/ Driver logs describing accessible taxi operation and operation of a conventional taxi.

2/ Summary information extracted from reports produced by the Blue Line computer dispatch system.

3/ Analysis of time to complete tasks, from an ergonomic assessment (described above).

4/ Time reports by test riders.

5/ Interviews with representatives of the taxi companies.

6/ Quarterly driver meetings.

7/ Fuel consumption reports from a conventional A-1 taxi.

8/ Maintenance cost analysis (described above).

9.1/ Background

9.1.1/ Overview of Economics of Taxi Operation

The economics of taxi operations depend to a large extent on the potential market for a multi-purpose accessible taxi. Although the Ottawa demonstration, using four accessible vehicles in a total taxi fleet of over 1,000 vehicles in Ottawa, is far too small to simulate operational conditions, the study has developed some data which provide at least a preliminary "order of magnitude" estimate of market potential for the accessible taxi operation.

The discussion of the economics of accessible taxi operation from the point of view of the driver and operator assumes that the accessible taxi operates as an integral part of a dispatched taxi fleet. This assumption has a number of implications for the analysis:

1/ Any subsidies are separate from conventional operations and are not considered in the analysis.

2/ All passengers pay the fare shown on the meter; no fare subsidy for disabled riders is considered.

3/ Passengers for the accessible taxis arise through the conventional means of calls dispatched, pre-arranged with the driver or dispatch, street stands or flag downs as the taxi cruises looking for fares. No fares arise from referrals from the accessible bus service, ParaTranspo.

On the basis of these assumptions, the economic assessment compares the costs and returns from the accessible taxis with the equivalent costs and returns from conventional taxis. From a policy point of view, this analysis examines the substitution of accessible vehicles for conventional vehicles in the taxi fleet. From the point of view of the driver and the company, accessible taxis will be substituted freely in the fleet if the accessible taxi shows earnings that are at least comparable to the returns achieved by conventional taxis. If drivers' earnings fail to match earnings available in conventional taxis, drivers would be reluctant to transfer to accessible taxis. If companies fail to achieve comparable returns, they will not acquire accessible vehicles for their fleet. In either situation, an economic analysis would predict that accessible taxis would be used only in special situations; general use as an integral part of the taxi fleet would require either a subsidy to compensate for any significant deficit in return or a change in licensing and/or regulations.

9.1.1.1/ Economics From the Driver's Point of View

As outlined above, both Blue Line and A-1 drivers typically lease the vehicle from the company for a set daily rate. The vehicle rental usually includes the taxi plate and dispatch service. The fares or tips earned during the period the vehicle is leased are applied to the lease charge and the overage is available to a driver as income. Since the accessible taxis operate as part of the dispatched fleet serving both non-disabled and disabled passengers, an assessment of the economics of the accessible taxi from the point of view of the driver faces different issues when serving the two types of passengers. Considering non-disabled passengers, the driver's economics turn on one basic issue:

Recognition. The accessible taxi should be equally as successful as a conventional taxi in securing fares at taxi stands, from flag-downs on the street and when dispatched to pick up a fare.

When serving disabled passenger, a series of new issues comes into play with respect to the the driver's economics; some tend to decrease the driver's earnings, others favour increased earnings. The final position from the driver's point of view will be determined by the relative weight of these tendencies:

1/ Duration of Trip. Since drivers face unpaid time and distance between trips, longer trips tend to increase a driver's earnings, as long as the time and distance between trips is not increased proportionately. In general, drivers prefer longer trips.

2/ Time to Assist Passengers. The time taken by the driver to assist disabled passengers to enter and exit the taxi is not paid. According to regulations, the meter should be started when the vehicle begins to move and should be stopped when the vehicle stops at its destination. Therefore, the time to assist passengers cuts into the driver's earning capacity.

3/ Peak Time of Travel. If the peak time for trips by disabled passengers occurs when demand from non-disabled passengers is relatively low, the accessible taxi will tend to be more highly utilized. If the peak time for disabled passengers falls outside of rush hours, an increase in utilization will be reflected in increased earnings since the taxi will be able to complete the trip without being impeded by traffic congestion.

The impact of these factors on a driver's earnings will depend to a large extent on the proportion of disabled passengers served by the accessible taxi.

Finally, from the driver's point of view, the operation of the accessible vehicle should compare to the cost of operating a conventional taxi in terms of:

1/ Reliability. The driver can only earn income if the vehicle is available for the full time covered in the lease payment. If the vehicle is not available during the driver's typical working hours, the driver will usually not be able to work because alternate or backup vehicles are usually not available. Therefore, the driver will suffer a loss in income for the period the vehicle is unavailable.

2/ Operating Costs. The driver pays for the fuel used during the lease period. Therefore, the accessible taxi fuel costs should compare to the fuel costs of a conventional taxi.

9.1.1.2/ Economics From the Company's Point of View

From the point of view of the company, the economics of integrating accessible taxis into a taxi fleet raises a number of operational issues and, most important, a question of return on investment. In more detail, the issues to be considered are:

1/ Dispatch. If the company has to adjust dispatch procedures, (and perhaps, modify computer software) extra costs may be involved in introducing accessible vehicles into the fleet.

2/ Maintenance Cost. The company bears the cost of maintaining the vehicles in the company fleet.

3/ Public Image. Operating accessible taxis could have a positive or negative impact on the company's image with customers. In the extreme, operating accessible vehicles could either improve business among non-disabled customers or turn customers to other companies that do not have accessible vehicles in their fleets.

4/ Return on Investment. Most taxi companies own a fleet of vehicles and earn a return on that investment through lease charges to taxi drivers. From the company's point of view, the accessible vehicles should offer a return on capital that compares to the return earned by conventional taxis.

5/ If accessible taxis serve individuals not now using the taxi system, offering the service expands the passenger base and the potential number of taxi trips in a municipality . This creates a rationale for the municipality to issue additional taxi licenses for new accessible taxis.

Some of these issues have been addressed above. The following sections complete the discussion of these issues and summarize the economics of accessible taxis from the point of view of the driver and the company.

9.2/ Market Potential

9.2.1/ Status of the Demonstration Project

The project provided for vehicles over the period of a year to serve the disabled community in Ottawa. As reported above, some potential users of the service have been reluctant to rely on the accessible taxis because they are only occasionally available when called. Four

taxis is too small a fleet to cover an area the size of Ottawa. Therefore, among target clients use of the taxi has been sporadic at best. Nevertheless, information from the baseline survey and the driver logs provide some insight into market potential for this service.

An estimate of potential made at this time -- when most potential users of this service have not actually experienced the service -- will provide very conservative estimates of potential. Typically in a service of this type, individuals will try the service once or twice. Where the service is satisfactory and appropriate to user needs, some of those experimental users will come to rely on the service and use it regularly. ParaTranspo in Ottawa offers a good illustration of this phenomenon. Although the service has been offered for a number of years, the rate of growth between 1989 and 1990 was of the order of 20% -- an amount far in excess of the growth in the disabled population. Obviously those who are eligible for ParaTranspo are making increased use of this service. Individuals are becoming familiar with the service and making more frequent use of it as time goes on.

The same growth in market potential should occur for an accessible taxi service. The data gathered in the baseline survey reflect responses to hypothetical questions -- the accessible taxi had not yet carried its first paying passenger when the survey was carried out. Therefore, potential users were not familiar with the characteristics of the service. Since the service is similar to a taxi with the sole exception of being accessible, adaptation of the service should proceed more quickly than for a new service in the community -- ParaTranspo. On this basis, one might predict a rapid growth in market potential from the estimates produced from the demonstration.

9.2.2/ An Estimate of Market Potential

9.2.2.1/ Baseline Survey Data

The baseline survey provided a brief description of the demonstration accessible taxis and asked respondents whether they would use the accessible taxi service. The responses indicated a projected level of use that would be substantially in excess of current use of

conventional taxis. About one-quarter of respondents answered "yes" to each of the following:

- Definitely would use it (22%).
- Probably would use it (24%).
- Might or might not use it (27%).

Based on the description, respondents were asked what they particularly liked about, or considered to be an advantage of the accessible taxi service. The most frequently mentioned features identified by potential users were:

- Available any time, on demand (22%).
- No booking in advance (15%).
- Assistance in and out of the vehicle (15%)
- Easy service to get around (13%)
- More freedom, no deadlines (10%)
- Convenient (9%).
- Faster service, no wait (6%).
- More comfortable, don't have to transfer in and out of wheelchair (5%).
- Time efficient (5%)
- For emergencies (4%).

Based on the description, respondents were also asked what they disliked or considered to be a disadvantage of the new service. The most frequently mentioned features were:

- Cost, price (26%).
- Too expensive, high cost of taxi fares, more expensive than ParaTranspo (16%).

For those who "would definitely" or "probably" use the service, about half (52%) indicated that the accessible taxi trips would be in addition to current trips, and 40% said the accessible taxi would replace some current trips.

9.2.2.2/ Extrapolating Survey Data to Ottawa

Considering only those responses in the baseline survey provided by households sampled randomly, the results can be extrapolated to the population of greater Ottawa. First, consider the number of individuals in Ottawa who would qualify as having a long-term disability that would relate to using the accessible taxi. In the survey, these individuals responded in the affirmative to this question:

> "By disability we mean any condition or health problem lasting six months or more that restricts the individual's ability to get around to the community. This might include people with hearing or vision disabilities as well as people with mobility-agility problems or other problems. Are there any disabled adults living in this household?"

Extrapolating the survey responses to greater Ottawa provides an estimate that about 6,700 individuals would satisfy this criterion. Of these, the survey indicates that about 900 would respond they "definitely would use the accessible taxi" and a further 2,100 "would probably use the accessible taxi". Therefore the accessible taxi has a potential client base of about 3,000 people who would take advantage of its accessibility feature. In order to provide a conservative estimate of the market potential, the analysis will assume that all of the 900 who "definitely would" use the service and half of the 2,100 who "would probably use" the service, will become regular users. Thus the calculation suggests 1,950 users -- for convenience, consider an initial population of 2,000 users of the service.

The survey responses also show that about half of the trips taken by these people in the accessible vehicle would be in addition to current trips by ParaTranspo, conventional taxis or private vehicles. On this basis, the survey results indicate that the number of taxi trips in Ottawa would expand appreciably if a full-scale accessible taxi service were available.

9.2.2.3/ Information from the Canada Health and Disability Survey

The transportation section of the Canada Health and Disability Survey examined the use of taxis by individuals who qualified as disabled. The survey reports that those who need special transit use taxis much more frequently, averaging about 3.1 trips per month, as compared to 1.4 trips per month by those who do not need special transit. Since 89% of respondents to the baseline survey were eligible for ParaTranspo (as reported in Chapter 8) it seems reasonable to assume that their use of accessible taxis will be at about the rate indicated by the Canada Health and Disability Survey. Of course, this assumption involves applying national statistics to a particular municipality -- a procedure which is not strictly correct from a statistical point of view. Nevertheless, it provides a means of arriving at an order of magnitude estimate of market potential. On this basis, the data would predict about 6,000 accessible taxi trips per month for Ottawa's disabled population.

9.2.2.4/ Size of Fleet Required to Serve the Potential Market

As outlined above, the analysis has estimated an initial demand from Ottawa's disabled population of about 6,000 trips per month for accessible vehicles. The estimate discounts the indicated level of use of the accessible vehicles but assumes that all taxi trips by the disabled population would be taken using the accessible taxis. For this reason, and because the analysis draws data from a variety of different studies, the estimate should be regarded as a rough "order of magnitude" approximation of the level of demand.

The driver logs report that on average, the accessible taxis involved in the demonstration averaged about 12% of trips serving disabled passengers. Assuming that this distribution of service would be consistent for a larger fleet of accessible vehicles, the total number of trips required to accommodate the estimated 6,000 trips for disabled passengers would be of the order of 50,000 trips per month for the accessible taxis.

The driver logs suggest that the accessible vehicles accomplished about 15 fares per shift. On a two-shift basis, this would suggest about 30 fares per day for each accessible vehicle. On this basis, and assuming 30 days operation per month for each accessible vehicle, the

estimates of market potential suggest a fleet of about 55 accessible taxis in operation on a two-shift basis to service the Ottawa market. This estimate could be adjusted to allow for days when the vehicles are not in service because drivers are only prepared to work six days a week and vehicles are unavailable because of service or breakdown. However, since this is a preliminary estimate based on a series of assumptions, the analysis should be interpreted to indicate that a fleet in the order of about 50 accessible vehicles would be required to service the Ottawa market.

As noted above, respondents to the baseline survey suggest that about half of the trips they would take in the accessible taxi would not be taken if the vehicles were not available. In light of this information, the analysis suggests that the Ottawa market for taxi services would expand by about 3,000 per month if a fleet of accessible vehicles were available. This estimate suggests that an additional four taxi licenses would be justified if 50 accessible vehicles were added to Ottawa's total fleet.

9.3/ Economics of the Driver

9.3.1/ Distribution of Fares Between Disabled and Non-Disabled Passengers

9.3.1.1/ Blue Line Dispatch Records Show Low Utilization by Disabled Consumers

On a daily basis, the dispatch program produces a summary report showing the calls booked for each vehicles and the number of calls refused. Of course a driver can operate entirely from taxi stands without using the dispatch computer if that is his wish. With the installation of the "cheat switch" by drivers, the computer records only dispatched calls. Therefore, while the number of calls booked is an indicator of activity, it is not complete. A further item of data is provided by the computer. "Stand 29" was established in the computer to record calls accepted by any driver in the fleet to serve disabled passengers. Blue Line confirms that it is reasonable to assume these calls were handled by the accessible vehicles -- the typical practice in the company. Therefore, the summary reports

provide a record of the total number of disabled riders served by Blue Line daily, monthly and annual basis.

The study team sought equivalent information from A-1 taxi. However with the manual dispatch system, the equivalent records are not available from A-1.

The Blue-Line dispatch records show that a total of 271 trips were dispatched for disabled riders in the 359 days for which information has been extracted (July 1989 to June 1990, with information missing for a small number of days because the computer was not operating). Over this period, the records show that car #48 was active for 285 days and car #416 for 320 days providing a total of 605 days service. For 16 days of the year, neither vehicle was working and for a further 93 days only one vehicle was working.

Disabled passengers were carried on a total of 112 days of the year. These data indicate that disabled riders account for 2.98% of all fares dispatched by the Blue Line computer.

9.3.1.2/ Driver Logs Reveal Driver Pre-booking by Blue Line Accessible Taxis

The driver logs show a somewhat different picture from that provided by the dispatch summaries. The Blue Line vehicles report that 8.9% (#48) and 17.3% (taxi #416) of all passengers carried while driver logs were maintained, were disabled. Averaging the results for the two vehicles, Blue Line results indicate that about 13% of all fares served were disabled passengers. For the period the comparison taxi was maintaining a log, the vehicle carried one disabled rider (0.2% of all fares). These data indicate that a substantial share of the trips Blue Line taxis made with disabled passengers were made without the assistance of the dispatch computer -- using arrangements such as pre-booking with the driver, prior agreement to pick up passengers for return trips, etc.

The driver logs maintained by A-1 drivers of the accessible vehicles show about the same percentage of disabled passengers being served as reported in the Blue Line logs. A-1 taxi #47 reports 15.7% of all passengers were disabled, 10.2% using wheelchairs or scooters

and 5.5% with other disabilities. A-1 taxi #50 reports 8.2% disabled riders, 2.8% using a wheelchair or scooter and 5.4% with other disabilities. Averaging the results for the two vehicles, disabled passengers made up about 12% of all A-1 fares.

These statistics are particularly interesting because A-1, with its voice dispatch system, established a reputation among disabled consumers of more likely responding to a call for an accessible taxi. However, the driver-initiated pre-booking of Blue Line accessible taxis appears to have raised the utilization of the Blue Line accessible taxis by disabled consumers to the level recorded by A-1.

Overall, the research indicates that the two companies served the same proportion of disabled passengers, about 12% of all passengers carried in the demonstration vehicles.

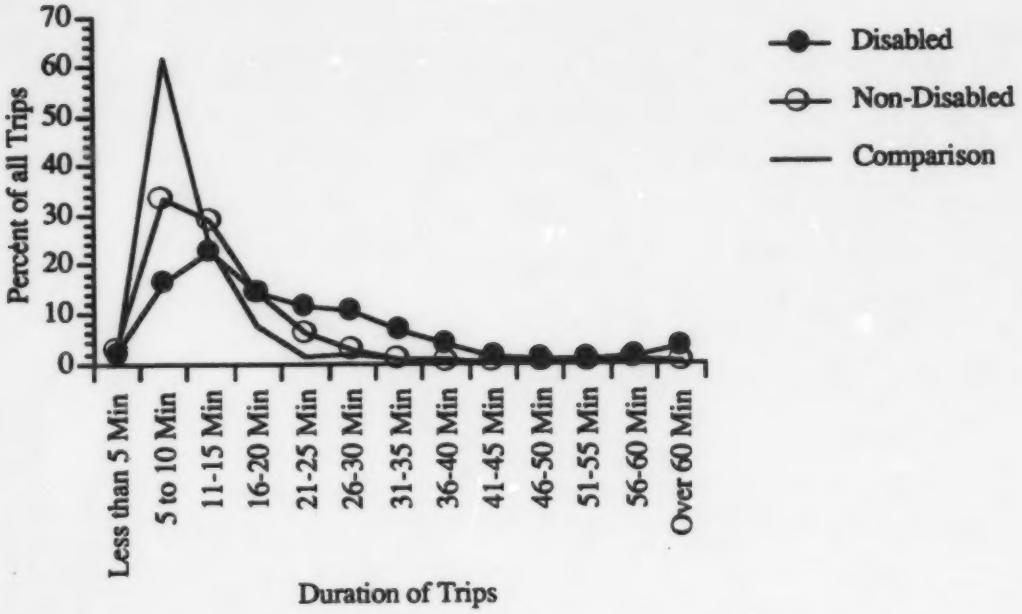
9.3.2/ Economics for Drivers Serving Disabled Passengers

9.3.2.1/ Disabled Passengers Take Longer Trips

The first concern of drivers is the average duration of a trip with a disabled passenger. If the trips are shorter, the potential return to the driver for that trip is reduced. In order to examine this question, the drivers recorded the time of pick up and drop off for each of the trips recorded in the driver log.

As shown in Figure 40, drivers report a small proportion of short trips on behalf of disabled riders with a higher proportion of trips lasting 20-45 minutes. Since the briefing on the driver's log requested that drivers report the time from the meter being turned on until it is turned off, this suggests that the actual distance travelled and therefore the fare earned by the driver tends to be higher for disabled passengers than for non-disabled passengers. A further examination of these data indicates that the average duration of a trip for a disabled passenger is about 22 minutes as compared to about 14 1/2 minutes for a non-disabled passenger. Therefore, the data indicate that, on average, the return to the driver for each trip is higher when the driver is serving a disabled passenger.

Figure 40/ · Duration of Trips For Disabled and Non-disabled Riders



Source: Abt Associates Driver Logs.

Note: "Comparison" indicates trip durations for comparison taxi (a conventional vehicle)

Unfortunately the data from comparison vehicles (conventional taxis) are sparse, reflecting only 436 trips from one vehicle. However, the comparison may be instructive. The conventional taxi shows 61.5% of all trips lasting between 5 and 10 minutes. The average trip lasts about 15 minutes, indicating that a few long trips offset the high proportion of very short trips.

In summary, the data indicate that accessible taxi trips with non-disabled passengers are comparable to trips by conventional taxis; and that trips with disabled passengers tend to be longer than trips with non-disabled passengers. Therefore, the analysis suggests that drivers of accessible taxis should suffer no deficit and may enjoy an advantage in average length of trip when serving disabled passengers.

9.3.2.2/ Time to Assist Disabled Passengers

Drivers typically assist disabled passengers to enter and exit the vehicle. The study developed two independent estimates of the time required.

The ergonomic study provides estimates of departure time. In the ergonomic study, departure time begins with the passenger available, waiting beside the vehicle, and the driver still in the driver's seat, and ends when the passenger has been assisted into the vehicle, the restraints fastened and the driver has returned to the driver's seat. On arrival, the time is calculated for the reverse sequence of activities. This careful examination of activities has led to an estimate of the total time to assist passengers at departure from origin plus time after arrival at destination of 6:32 minutes for the raised-roof vehicle and 6:29 minutes for the lowered-floor vehicle.

Test riders also provided estimates of time to assist disabled passengers. Test riders recorded the time required from arrival of the vehicle until the driver returns to the driver's seat; and on arrival at their destination, from arrival until the driver returns to the driver's seat. The test riders estimated that, on average, these times amount to a total of 9 3/4 minutes. The two estimates are comparable. Passengers note that drivers often assist

disabled passengers to exit and enter the building, adding a significant time element that is not included in the estimate produced by the ergonomic study.

9.3.2.3/ Peak Time of Travel

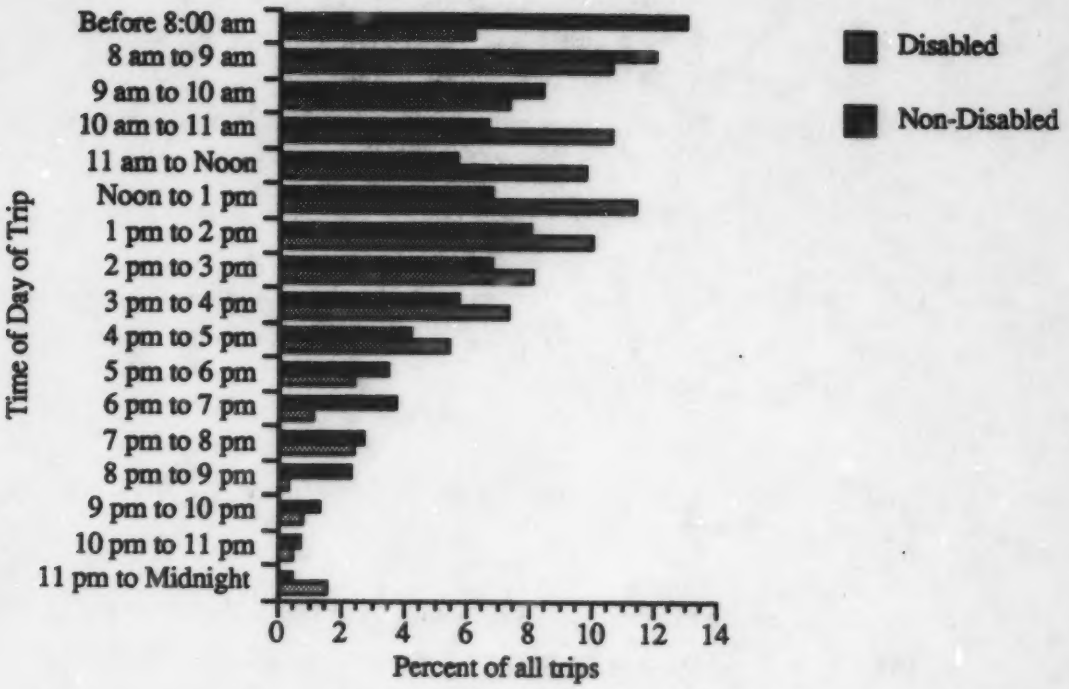
If the peak time of travel by disabled riders occurs when the accessible taxi is already heavily utilized serving non-disabled passengers, the driver will not be able to earn additional income from the added demand. However, if the peak time of travel by disabled passengers arises when taxis are less heavily utilized, serving disabled passengers may improve the overall utilization of the vehicles and improve drivers' earnings, as compared to conventional taxis. Further, if any increase in utilization should occur when traffic is relatively light, the additional fares should yield relatively higher earnings for drivers of the accessible taxis.

Figure 41 shows that trips with disabled passengers tend to complement the trips with non-disabled passengers. In other words, when the vehicles are busiest with non-disabled passengers, relatively few disabled riders are served. However, when the demand from non-disabled passengers falls off after nine in the morning, the demand from disabled passengers rises. Note that this pattern of use is confirmed by the data reported from test riders (see section 8.1.2 above). These data suggest that accessible vehicles may experience a better utilization over the total shift, finding additional fares among disabled riders when business is relatively slow for conventional taxis.

The time of peak demand for disabled passengers tends to fall in a period when traffic is relatively light - beginning in the morning rush hour, 8:00 a.m. but extending through 2:00 p.m., a period of relatively light traffic.

Therefore considering both aspects, peak demand and traffic conditions, the trips serving disabled passengers should, on average, yield slightly higher earnings to the driver of an accessible vehicle as compared to driving a conventional vehicle.

Figure 41/ Distribution of Accessible Taxi Trips by Time of Day



Source: Abt Associates Driver Logs.

9.3.2.4/ Summary: Economics for Drivers Serving Disabled Passengers

The analysis outlined above indicates that disabled passengers made up about 12% of the total passengers served by the accessible taxis. The driver logs also indicate that the vehicles average about 12 fares per shift. Therefore, the data suggest that the driver will invest on average about 15 minutes per shift assisting disabled passengers (considering 12% of 12 fares or an average of 1.44 fares for disabled passengers per shift, and about 10 minutes assisting time per disabled fare).

Overall, the maximum deficit for a driver of an accessible taxi appears to be about 15 minutes per shift. However, the time assisting passengers may be offset by the additional duration of trips for disabled passengers.

9.3.3/ Recognition on the Street -- Taxi Stand and Street Fares for Non-Disabled Passengers

For the uninitiated, the accessible vehicles do not look like taxis. Therefore, the accessible taxis may suffer some deficit in the number of fares they accomplish per day. The analysis examined the source of fares to determine if the accessible vehicles show the same general profile as the conventional taxis.

Figure 42 shows that Blue Line accessible taxis have about the same profile for source of fare as the Blue Line comparison vehicle, with the exception that drivers of the accessible vehicles have arranged some pre-booked trips. Therefore, the data indicate that the lowered-floor accessible vehicles are not suffering a deficit in the number of fares they handled on behalf of non-disabled passengers.

The A-1 accessible taxis show the profile expected for a taxi from that company; few trips originating from street stands and the difference made up by an increased reliance on dispatched trips. The A-1 vehicles show 3.3% of all trips pre-booked and dispatched -- in other words arranged in advance through the dispatcher. This reflects the arrangements

made to accommodate the accessible taxis within A-1's voice dispatch system, an option not available in the computer-dispatched Blue Line system.

Because A-1 was unable to provide driver logs for comparison vehicles, the analysis cannot assess any difficulty that the raised-roof vehicles may have encountered in picking up fares on the street (these would be reported as "street stand"). Drivers remain convinced that the raised-roof vehicles are not readily recognized as taxis and they lose business a result.

Figure 42/ Source of Fares for Accessible Taxis

Source of Fare	Percent Blue Line Accessible Taxis (n = 2,880)	Percent Blue Line Comparison Taxi (n = 2,048)	Percent A-1 Accessible Taxis (n = 436)
Dispatch	65.3	71.8	92.1
Street Stand	28.5	27.1	1.5
Pre-Booked	5.2	0.7	1.7
Dispatched Pre-Booked	0.5	0.2	3.3
Not Stated	0.5	0.2	1.4

Source: Abt Associates Driver Logs.

9.3.4.1/ Operating Cost of the Vehicle

The vehicles used in the test, modifications of the Chrysler "Magic Wagon", are reputed to be relatively fuel efficient. One A-1 driver of a conventional taxi co-operated with the study by maintaining a record of fuel consumption and cost for one month. These data indicate an average fuel efficiency of 14.7 liters per 100 km travelled and an average cost per day for fuel of $16.22. Unfortunately comparable detailed statistics were not available on the accessible vehicles because drivers did not maintain the requested fuel logs. However, the anecdotal reports of fuel costs suggest that the vehicles are relatively fuel efficient. Drivers report that fuel costs for the Blue Line vehicles run about $22 - $26 per day, compared to $11 per day for a V-6 taxi running on propane and about $18 per day for a V-8 Chevrolet on propane or a V-6 on gas. Blue Line drivers were paid $8 per day compensation because the accessible taxis could not be converted to propane. Therefore the fuel cost to Blue Line drivers was comparable to some conventional taxis. When new drivers began to operate the Blue Line vehicles, they reported the operating costs as "good" compared to conventional taxis

A-1 drivers report that the raised-roof vehicles experienced average fuel costs of about $15 to $18 for a 12-hour shift.

Based on these data, the study cannot identify significant differences in the fuel costs experienced by the accessible vehicles as compared to fuel cost for conventional taxis. It should be recognized that, fuel efficiency varies widely among drivers of the same vehicle driving under the same conditions. Therefore, the drivers' impressions of "good" fuel economy represent the best evidence the study could get, short of detailed records that would allow comparisons for the same driver on the accessible vehicle and a conventional taxi.

9.3.5/ Economics of the Driver: Conclusion

The analysis suggests that the time taken by the driver to assist disabled passengers as they enter and exit the taxi tends to be offset by two factors:

1/ Longer trips for disabled passengers.

2/ Complementary peak time of travel for non-disabled and disabled passengers with disabled passengers tending to travel during the mid-morning and afternoon, off-peak times for non-disabled passengers.

From the driver's point of view, the time taken to assist disabled passengers is clearly visible. Differences in length of trip or demand for the accessible vehicle during off peak hours are much less tangible. Therefore, while the analysis suggests that the driver of an accessible taxi will not experience a significant difference in income compared to driving a conventional taxi, the perception may remain that the uncompensated time to assist disabled passengers represents a decrease in income.

The lowered-floor vehicles show no deficit in the fares from street stands, although raised-roof vehicles may not be as successful in that regard. The major factor the research was unable to verify is the reported poor recognition of the raised-roof vehicle as a taxi and therefore some reduction in the number of fares that drivers of these vehicles pick up on the street. Except for this factor, the evidence suggests that the operation of an accessible vehicle should yield returns to the driver about equal to those available to a drivers of conventional taxis.

This discussion ignores the reliability of the accessible vehicle. As noted above, one vehicle of each type has suffered substantial interruptions in service. Such interruptions could have serious consequences for a driver's earnings.

9.4/ Implications for the Firm

9.4.1/ Dispatch

From the point of view of the firm, accessible vehicles represent a new feature in the fleet which has to be accommodated in dispatch procedures. The difficulty of dispatching these vehicles during the trial was a continuing source of irritation to both the Blue Line staff and

potential users of the vehicles. It appears that under the conditions of a demonstration, a voice dispatch system is relatively flexible and can more easily accommodate the requirements such as pre-booking, confirmation of availability of an accessible taxi, etc. In the case of the Blue Line dispatch system, with its high volume and computer-aided dispatch, these features are more difficult to accommodate. If a company such as Blue Line with a computer-aided dispatch system were to operate a substantial number of accessible vehicles in the fleet, such accommodations would have to be included in the system. Such changes would involve some development costs that would need to be repaid by the accessible taxi component of the fleet.

9.4.2/ Maintenance Costs

As reported above, Blue Line experienced maintenance costs for the lowered-floor vehicles that were less than the cost for a roughly comparable group of relatively new conventional taxis. However, the reports of extensive repairs under warranty for one A-1 vehicle and the time to repair the wiring harness on one Blue Line vehicle raise questions about the reliability and the long-term maintenance cost of the accessible taxis.

Taxi companies earn returns on their investment in vehicles in the form of lease charges to drivers. If a vehicle suffers extensive down time because of repairs either to the basic vehicle or to the accessibility modifications, lease payments and therefore the return on the capital investment in the accessible vehicles will be reduced. While the accessible vehicles used in the demonstration are still relatively new, the preliminary evidence suggests that they may experience interruptions in service and maintenance costs in excess of those experienced by conventional taxis.

9.4.3/ Public Image

The evidence from the demonstration suggests that offering an accessible taxi service may enhance the public image of the taxi operator. Of course, measuring the impact of a new

service on company image is an imprecise art at the best of times. In this case, the analysis relies on three factors:

1/ Strongly favourable reactions from disabled passengers.

2/ Favourable reactions from non-disabled riders as indicated by

- the profile of source of trips, showing the same profile for accessible and conventional taxis.
- near absence of refusals to ride the accessible taxis.
- few reports that non-disabled passengers would not ride again (and these usually because the passenger felt they might be displacing a disabled passenger).

3/ Favourable publicity in the media. While the Steering Committee could not engage in publicity because of the limited scale of the demonstration, the favourable treatment of the service by the local TV news coverage of the training sessions for accessible taxi drivers suggests that a publicity advantage may accrue to companies offering accessible taxi services.

These three factors, taken together, tend to support the contention that offering accessible taxi service as part of a taxi fleet will enhance the company's image.

9.4.4/ Return on Capital Invested in the Vehicle

Companies are primarily concerned with the capital cost of acquiring new accessible vehicles. As noted above, few taxi companies purchase new vehicles for use in their fleet. Most buy three to four year old vehicles for prices that may range from $7,000 to $10,000. In comparison, the purchase price of an accessible vehicle is in the order of $35,000, defrayed by the $5,000 grant offered by the Government of Ontario. Therefore from the point of view of a taxi operator, accessible vehicles carry a net cost that is about $20,000 in excess of the usual cost to add a conventional taxi to the fleet.

Blue Line has a history of buying some new vehicles. For example, the analysis of maintenance records reported above summarized the maintenance costs of seven new vehicles in the Blue Line fleet. Therefore, comparison of capital cost with a new conventional taxi may be instructive. Following this comparison, the company would

experience a net additional capital cost of about $10,000 for a new accessible taxi, allowing $30,000 for the cost of the accessible vehicle (after subsidy) and up to $20,000 for a new "full size" vehicle such as a Ford Crown Victoria.

To get some appreciation of the implication of the capital cost for the taxi operation, an analysis was carried out to calculate the increase in daily lease payments required to pay back the extra cost of an accessible taxi over four years, assuming a 20% return on investment. On this basis, an extra capital cost of $10,000 requires about $10 per day additional lease charge to pay back the investment (and $20,000 capital represents $20 per day).

The arrangements with drivers in the Blue Line and A-1 operations and the calculated returns to the drivers indicate that drivers will not be in a position to pay increased lease fees for use of the accessible taxis. Therefore under current conditions the company cannot earn a direct return on the investment in accessible vehicles that is comparable to the return on conventional vehicles.

9.4.5/ Additional Licenses

Accessible taxis may expand the market base for the taxi fleet and create a rationale for additional taxi licenses to be issued.

The value of taxi licenses varies substantially across municipalities and the Ottawa regional licensing proposal was a matter of current debate during the period of this study. However, depending on the local regulatory environment, issuing additional licenses for accessible taxis may create an inducement for some operators to incur the extra capital cost and offer the service in order to acquire additional licenses.

9.4.6/ Economics of the Firm: Conclusions

From the taxi operator's point of view, operating an accessible service may offer some advantages. An accessible taxi displaying the company colours may yield some public relations benefits. Accessible vehicles may offer advantages to non-disabled passengers who have bulky packages or luggage or who are unusually tall. However, these benefits are small compared to the incremental capital costs.

If taxi operators buy used vehicles, the net incremental cost of an accessible vehicle is of the order of $20,000. On those occasions where taxi operators purchase new vehicles, the incremental costs is of the order of $10,000. Under the conditions of the demonstration, the companies could identify no sources of revenue that would provide an economic return on this incremental investment. Therefore it appears unlikely that a company such as Blue Line or A-1 will invest in significant numbers of new accessible vehicles as long as the capital cost to the company is substantially in excess of that experienced when adding conventional vehicles to the fleet.

The impact of possible changes to the restrictive conditions of the demonstration is discussed above, in section 2.7.3.

10/ THE OPERATIONAL EXPERIENCE

This chapter offers a commentary on operating issues not already covered and suggests some considerations, or "lessons learned" that may be instructive for other operators of accessible taxi services.

10.1/ Operating Procedures

10.1.1/ Dispatching

The experience of the Ottawa demonstration illustrates the importance of order-taking and dispatch facilitates that reflect the nature of accessible taxi service and the needs of its clients. The voice dispatch system used by A-1 allows that company to arrange pre-booking of trips by the dispatcher, facilitate prompt responses on the availability of vehicles, etc.

In contrast, the relatively rigid computer dispatch system used by Blue Line was, for the purposes of this trial, much less responsive to the needs of disabled users. The problem was exacerbated by the limited number of accessible vehicles available. When the calls came in for an accessible taxi, the supervisor queried the computer to find that no accessible taxis were operating or they were in distance parts of the city. Blue Line was often unable to respond to many of the calls for their accessible vehicles. The Blue Line problem was made more complex by the size of its fleet. The company faced the challenge of handling a handful of calls per day for the accessible taxis among more than 10,000 calls for its conventional vehicles. In such a busy dispatch operation, it should be no surprise that on occasion, individuals wishing to use the accessible vehicles felt their request was not handled properly, efficiently and with due understanding of the needs and concerns of disabled passengers.

If either company operated an expanded fleet of accessible vehicles, the dispatch requirements should be more easily accommodated. The key criterion for a successful

operation is integration of the accessible vehicles into the conventional taxi fleet. In principle, one would expect that a call for an accessible vehicle should be responded to in about the same time as a call for a conventional vehicle. With sufficient vehicles available, the computer dispatch system used by Blue Line and A-1's voice dispatch system should be equally adept at responding to calls. However, call-takers and dispatchers have to recognize that disabled passengers have special needs. They run a risk of being stranded if an accessible vehicle is not available for their return trip. Particularly in their first few uses of new system, disabled passengers may be quite uncertain about its reliability.

Clearly, appropriate training and sensitizing of call-takers and dispatchers is necessary to ensure successful dispatching of accessible vehicles. The experience of the demonstration project indicates that any full scale operation of an integrated fleet should provide appropriate training and support to ensure that call-takers and dispatchers recognize and respond to the needs and concerns of disabled and other passengers requesting service from an accessible taxi.

10.1.2/ Training Manual

In conjunction with other training aids -- films, videos, in-class presentations, "hands-on" experience assisting passengers, tying down chairs, etc. -- a training manual should be available to operators and drivers of accessible taxis. This manual should examine a number of issues related to transporting disabled riders including

1/ Type of limitations and mobility aids drivers might encounter.

2/ Schematics of the restraint system with suggestions on how to accommodate a variety of chairs.

3/ The "do's" and "don'ts" of loading and unloading wheelchairs.

4/ Proper lifting procedures to minimize risk to the driver and passenger.

5/ Modifications that need to be made to driving styles when transporting disabled riders.

6/ Regulations surrounding the use of restraints.

7/ The transportation of scooters.

8/ Etc.

10.2/ Complaints and Accolades for the Demonstration

10.2.1/ Availability

During the demonstration, the major problem for disabled riders was the uncertainty whether the vehicles would be available when requested. They could not depend on the service. In the demonstration, the problem of availability stemmed from these main factors:

1/ **Hours of operation.** While A-1 Taxi double-shifted the vehicles, providing 24-hour service to the community, up until almost the end of the demonstration, Blue Line drivers generally limited their hours of operation to between 8:00 a.m. and 7:00 p.m., six days per week. As of April 4, 1990, Blue Line recruited two replacement drivers for one of the vehicles; the other vehicle, however, was driven by a single driver. There was, in short, virtually no service during the evening hours or on weekends, the times when disabled persons would be more likely to make discretionary trips which lend themselves to taxi service. An analysis shows that on 16 days during the year, neither Blue Line vehicle was operating and only one vehicle was operating on 93 days of the year.

2/ **Number of vehicles in operation.** The accessible taxis operate as conventional taxis, four vehicles in a total fleet of about 1,100 taxis serving Ottawa and environs. Four vehicles cannot cover the entire area satisfactorily. Also, the drivers may not accept every call from a disabled passenger. Reasons for rejection may include instances when the taxi is already occupied; the taxi is far from the pick-up point; the driver has the opportunity for another fare more easily; the vehicle is out of service for maintenance or repair; the driver is not working, etc.

3/ **Blue Line's dispatch system.** Blue Line had difficulty dispatching its vehicles to disabled persons due to the nature of its dispatch system. Blue Line was often unable to tell callers whether or not the vehicles were available. In a voice-dispatched system, the dispatcher knows the location and status of the vehicles and it is a simple matter to dispatch the vans. Blue Line, with its computerized dispatch system has to go through a relatively complicated process to accomplish the same end.

The basic problem is number of vehicles. Because Blue Line was operating only two accessible taxis in a fleet of about 700 vehicles, the accessible taxis tended to be "lost in the system". The calls came in to a "call taker" who is expected to complete a target number of calls per hour. The "call taker" checks with the Terminal Supervisor to find out the status of the vans (in service?, occupied?, location?, zone?). The supervisor

checks and responds. In the interim, the "call taker" has the caller on hold and cannot respond to other calls. Therefore, the call taker is under pressure to respond from a number of sources: the call on hold; the interruption of the supervisors; and the backup of other calls in the queue waiting to be answered. Consequently, there may be a tendency to react with a set answer, "no accessible taxi is available."

In general, users of the service describe A-1 as "more accommodating" than Blue Line, noting that A-1 would pre-book trips. However, as riders pointed out, if you have to pre-book, you might as well use ParaTranspo, and ParaTranspo is cheaper.

Users criticized Blue Line for being "off-hand" when riders called requesting an accessible taxi. Oftentimes, they did not know where the taxis where, if they were available, or, in those instances when they knew they were unavailable, did not know when they would be available. The frustration for those requesting the accessible taxi was compounded because Blue Line would not pre-book. Clearly, full-scale operation of an accessible service would require that Blue Line's computer dispatch system and order taker routines should be adapted to the needs of disabled clients.

10.2.2/ Publicity

All those involved in the demonstration would concede that more advertising and publicity of the accessible service would have been done. There was little in the way of a formal publicity campaign. Initially, the project received somewhat negative press as a result of Blue Line's delay in recruiting drivers for the vehicles and preparing the vehicles for service. Transport Canada subsequently developed an information sheet on the project. An information/photographic session was held with the press on December 14, 1989, following the Advisory Committee Meeting. However, because of the limited scope of the demonstration, four accessible taxis among a total Ottawa fleet of over 1,000 taxis, publicity was kept deliberately low key to avoid creating a level of demand and service expectations that could not be satisfied.

There was never any expectation that the four demonstration vehicles could meet the demand for such a service. Given the high rate of refusals, the Steering Committee was

reluctant to raise expectations further with an extensive publicity campaign. To the end of the demonstration, passengers -- non-disabled and disabled alike -- had difficulty recognizing the vehicles as taxis. However, drivers report that recognition was gradually improving, particularly among non-disabled taxi users in the areas of the city usually served by the drivers.

Reference:

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(3) Cluff, Pamela. Accessible Residential Communities: Issues and Solutions. Toronto: Prepared for the Policy Evaluation Division, Canada Mortgage and Housing Corporation by Associated Planning Consultants Inc., October 1982.

(4) Analysis of Taxi Users: TDC/Hickling Transportation Information Base, Hickling REF: 2608, June 21, 1990.

1. INTRODUCTION

1.1 Contexte

Il y a longtemps que les gouvernements fédéral et provinciaux s'intéressent à la question de la mobilité des personnes handicapées physiques au point d'en faire une question politique. Les programmes spécifiquement conçus à cet égard veulent favoriser l'accès au travail, éliminer les barrières architecturales et accroître l'accessibilité des moyens de transport. La population visée, quant à elle, veut des transports à prix réduits pour les personnes handicapées ainsi qu'une accessibilité universelle. Dans un tel contexte, les gouvernements mesurent à sa juste valeur l'apport d'un taxi qui soit accessible à tous les citoyens, sans exception.

En octobre 1987, Transports Canada et le ministère des Transports de l'Ontario avaient défini conjointement les paramètres d'un projet de démonstration d'un taxi accessible faisant la navette entre Ottawa et son aéroport, le but étant de vérifier la rentabilité d'un tel service. Plus tard, ce projet a été étendu à toute la ville d'Ottawa, de manière à constituer un service de taxis universel apte à desservir aussi bien les passagers à mobilité réduite que les autres. L'évaluation a porté surtout sur les indicateurs économiques : qualité du service, performances et rentabilité. Pour pouvoir conclure à la réussite du projet, il fallait que les sociétés de taxis l'acceptent comme une entreprise commerciale viable, qu'il soit bien accueilli par les clients, handicapés ou non et, au bout du compte, qu'il débouche sur la création d'un service de taxis accessibles n'ayant rien à voir avec la démonstration.

La décision d'aller de l'avant a été remise jusqu'en octobre 1988, date à laquelle le ministère a annoncé son intention de lancer la phase I du projet, à savoir la définition de l'étude de faisabilité d'un taxi accessible dans la région d'Ottawa. Cette étape a été achevée en février 1989, et le ministère a décidé alors de passer à l'étape suivante, celle de la campagne de démonstration.

Transports Canada avait fait l'acquisition de quatre mini-fourgonnettes modifiées en 1988 : deux rachetées d'Air Surrey (il s'agit des deux à pavillon surélevé) et deux de Care Concepts (les deux à plancher surbaissé). Loués à la société Blue Line Taxi d'Ottawa, ces quatre véhicules devaient servir pour la durée de la démonstration. En réalité, deux

sociétés se sont partagé cette tâche. La Blue Line a conservé les deux véhicules à plancher surbaissé, tandis que les deux à pavillon surélevé ont été remis à A-1 Taxi qui les mis en service à partir du 20 octobre 1989. Les figures 1 et 2 montrent les véhicules à pavillon surélevé et à plancher surbaissé, respectivement.

Il avait été convenu que la démonstration se ferait à très petite échelle : quatre taxis accessibles sur un total dépassant le millier de taxis classiques à Ottawa.

La campagne de démonstration et l'évaluation des résultats ont été financées conjointement par le ministère des Transports de l'Ontario et le Centre de développement des transports. Abt Associates of Canada a reçu le mandat de définir le projet de démonstration et, plus tard, celui d'en évaluer les résultats. Ces deux volets du projet ont été gérés par un comité de direction formé de représentants du ministère des Transports de l'Ontario, de Transports Canada et du Centre de développement des transports. Fait à noter, la campagne de démonstration ne fait pas partie du programme de taxi accessible lancé par l'Ontario. Les deux volets du projet constituent une action de recherche sur la faisabilité technico-économique d'un taxi adapté capable de transporter aussi bien des passagers à mobilité réduite que les autres et de fonctionner à l'intérieur du système de régulation d'un parc de taxis classiques. Autre fait, la campagne n'ayant eu pour cadre que la seule ville d'Ottawa, il est logique que certains des résultats obtenus soient le reflet des caractéristiques économiques de cette ville et celles des entreprises de taxi la desservant. Il ne faudrait donc pas généraliser ces résultats sans tenir compte de cette réserve.

La campagne devait commencer en avril 1989, mais elle a été retardée afin que les véhicules puissent être modifiés, les chauffeurs recrutés et une période de rodage achevée. Ce ne fut qu'en mai 1989 qu'elle fut officiellement inaugurée, date à partir de laquelle les résultats devaient être colligés pendant 12 mois.

Figure 1. Taxi à pavillon surélevé

Figure 2. Taxi à plancher surbaissé

1.2 Définition et objectifs

Le mandat original ayant été redéfini en octobre 1988, la campagne de démonstration a eu pour objectif général ce qui suit :

« Faire la démonstration et l'évaluation des taxis adaptés faisant partie du parc de taxis classiques desservant la ville d'Ottawa et utilisés pour le transport de personnes à mobilité réduite en service général et aéroportuaire. »

Les objectifs particuliers ont été les suivants :

1. Chiffrer les temps d'utilisation et les distances parcourues lorsque ces véhicules transportent des personnes à mobilité réduite, et les exprimer en pourcentage des totaux temps et distances en service.
2. Évaluer les résultats sur le plan des technologies utilisées.
3. Mesurer le degré d'acceptation des clients ainsi que la viabilité commerciale globale de ces véhicules.
4. Approfondir l'aspect financier de cette exploitation.
5. Approfondir l'aspect ergonomique de cette exploitation.
6. Évaluer le programme de formation mis en oeuvre par la société de taxi et élaborer des aides à la formation inspirées de ce programme.
7. Élaborer un projet de spécification concernant un taxi accessible à partir des résultats obtenus.
8. Évaluer les aspects opérationnels de cette exploitation.

A l'étape de l'étude de définition du projet de démonstration, Abt Associates est parvenu à la conclusion que certains des objectifs ci-dessus se recoupaient. Après mûre réflexion et concertation avec ses mandants, Abt Associates a regroupé ces objectifs particuliers en quatre axes de recherche ou, plus précisément, en quatre sous-objectifs, à savoir :

1. **Viabilité économique du service** (objectifs 1 et 4) . Comme le souligne le rapport issu de la phase I, les résultats correspondants devaient pour la plupart être tirés des données fournies par l'ordinateur de la société Blue Line.
2. **Viabilité opérationnelle du service** (objectifs 2, 5, 7 et 8). A l'issue de discussions entre le Comité de direction et le contractant, il a été convenu que le but de la recherche n'était pas d'élaborer une spécification technique détaillée concernant un taxi adapté, mais plutôt de faire appel à des idées ou suggestions concernant l'aménagement des taxis

accessibles, que l'on pourrait inclure dans une spécification à l'occasion d'une acquisition future. Elles concerneront, par exemple, les options qui permettraient d'améliorer ou de rehausser la qualité du service.

3. **Degré d'acceptation du véhicule** (objectif 3) . Aux fins de l'appréciation correspondante, il faut obtenir l'information nécessaire de plusieurs sources, mais surtout auprès des clients eux-mêmes, handicapés ou non handicapés.

4. **Formation des chauffeurs** (objectif 6) . D'après les conversations avec la Blue Line et le comité de direction, il est apparu que Blue Line avait l'intention de tirer parti de son expérience acquise dans la formation des chauffeurs de son service ParaTranspo ainsi que de se servir du vidéo produit par l'Association des transports urbains du Canada. Il fut alors convenu que le rôle des consultants se limiterait à assister Blue Line en matière de formation, cette société gardant l'entière responsabilité dans ce domaine et formalisant les résultats dans des documents définitifs. Pour sa part, les consultants travailleront de concert avec Blue Line pour affiner le programme de formation et le valoriser par des techniques appropriées. L'évaluation de ce programme, s'inspirant des rapports sur les essais effectués par des personnes handicapées ainsi que de l'examen ergonomique, doit montrer dans quelle mesure il a permis d'inculquer aux chauffeurs les habitudes et les techniques de conduite prévues.

Le rapport, issu de la phase I de l'étude, présente les suggestions faites par Abt Associates concernant la définition du projet de démonstration d'un service de taxis accessibles dans la ville d'Ottawa. Il présente en outre le sommaire d'un plan de recherche ainsi que la description des principaux éléments devant constituer la campagne de démonstration et d'évaluation en service. Étant donné qu'il constitue en somme la charpente de la recherche dont il est rendu compte ici, le plan de recherche est repris in extenso à l'annexe A.

2. SOMMAIRE ET CONCLUSIONS

2.1 Introduction

2.1.1 Nécessité du transport adapté

Les deux dernières décennies ont été marquées par une expansion rapide des services communautaires pour les personnes handicapées du Canada. Tant les associations de consommateurs que les initiateurs de programmes gouvernementaux s'entendent sur un même point : les rapports entre les collectivités et les personnes atteintes d'incapacité physique doivent être régis par la notion d'autonomie, elle-même axée sur un objectif de participation à la vie collective. En effet, sans une participation pleine et entière à la vie de la collectivité qui les entoure, les personnes atteintes d'incapacité ne sauraient atteindre leur autonomie, ni s'épanouir comme elles le désirent. Or la clé d'une telle autonomie ce sont les transports, des transports accessibles et d'accès facile qui, malheureusement, ne sont pas toujours disponibles.

Certaines collectivités mettent à la disposition des personnes incapables d'emprunter les transports en commun des véhicules, autobus ou fourgonnettes, spécialement adaptés. Sauf qu'il s'agit là de services ne répondant pas au critère d'accessibilité universelle. Or la population handicapée du Canada aspire à un réseau de transport non seulement accessible, mais aussi d'accès universel. Les divers paliers de gouvernement tiennent compte de cette volonté en veillant à ce que les nouveaux systèmes de transport répondent à ces critères.

Les besoins de transports accessibles ne font qu'augmenter, d'année en année, à mesure que les personnes atteintes d'incapacité physique deviennent de plus en plus autonomes et que la population du Canada vieillit. Les transports adaptés et accessibles doivent donc suivre une courbe de croissance à la mesure de celle des personnes à mobilité réduite.

La présente étude s'est penchée sur une solution pleine de promesses : le taxi accessible fonctionnant à l'intérieur d'un parc de taxis classiques. Cette solution a l'avantage de remplir la condition d'accessibilité universelle. Or, pour qu'il puisse réussir son intégration et son exploitation à titre de taxi comme les autres, le taxi accessible doit remplir plusieurs conditions difficiles : transporter des personnes non handicapées aussi bien qu'à

mobilité réduite, dégager une fiabilité et des coûts d'exploitation égaux à ceux des taxis classiques, laisser aux chauffeurs et aux entrepreneurs une marge bénéficiaire comparable à celle des taxis classiques.

Dans ces conditions, l'évaluation de la viabilité commerciale des taxis accessibles intégrés dans un parc de taxis classiques se fait en fonction des recettes tirées des déplacements sur appel ou sur réservation des clients qui se présentent aux postes de taxis ou qui sont pris en charge dans la rue. Mais elle ne tient aucunement compte des recettes éventuelles tirées de services contractuels réguliers rendus à la clientèle atteinte d'incapacité. Car, même si cette dernière suffit à rentabiliser les quelques premiers taxis accessibles, elle ne suffira certainement pas à rentabiliser tout un parc de taxis adaptés, de la taille nécessaire à satisfaire à la demande potentielle pour des services de transport accessibles. Pour devenir aussi nombreux que les taxis classiques, au point de fournir à la clientèle handicapée un niveau de service et une rapidité comparables, les taxis accessibles devront pouvoir compter sur les mêmes sources de revenus que les premiers. C'est pourquoi l'examen de leur rentabilité s'est-il fait par rapport au critère le plus rigoureux qui soit, c'est-à-dire les performances dans tous les domaines où ils concurrencent directement les taxis classiques.

2.1.2 Taxis accessibles et clientèle atteinte d'incapacité

Deux enquêtes nationales menées par Statistique Canada, Enquête sur la santé et l'incapacité au Canada et Enquête sur la santé et les limitations d'activités, soulignent sans l'ombre d'un doute le besoin profond ressenti par la population handicapée pour des services de transport accessibles plus nombreux et de qualité améliorée. Ces mêmes enquêtes ont permis de faire deux constatations particulièrement importantes au regard de la présente recherche :

1. Les personnes qui ressentent le besoin de services de transport spéciaux sont les mêmes qui utilisent plus ou moins assidûment les services de taxis (en moyenne 3,1 déplacements par mois comparativement à 1,4 pour les personnes qui peuvent utiliser un véhicule privé). Il s'agit ici de taxis classiques vu la rareté des taxis accessibles.

2. On aurait pu croire que, vu le coût d'un déplacement en taxi, les personnes à faible revenu s'en abstiendraient en grande partie. Or, c'est le contraire qui est vrai. Les personnes qui disposent d'un revenu annuel entre 5 000 et 10 000 $ utilisent plus

souvent le taxi pour leurs déplacements que la population dans son ensemble : 1,9 déplacement par mois contre 1,4.

Donc, l'idée que le coût du taxi accessible serait un facteur limitatif aux yeux de la clientèle handicapée est dénuée de fondement, comme l'ont prouvé les deux enquêtes en question.

2.1.3 Services de taxis accessibles en Ontario

Les services de taxis accessibles existent depuis peu en Ontario. Une enquête téléphonique faite au début de 1989 auprès de six entrepreneurs ontariens montre que tous les véhicules accessibles dont ils disposent ont été achetés depuis 1988 grâce aux subventions allouées au titre du Wheelchair Accessible Taxi Demonstration Program de l'Ontario. Les résultats de cette enquête correspondent donc aux quelques premiers mois d'exploitation.

Les répondants ont, de façon générale, déclaré avoir eu à surmonter plusieurs difficultés sur le plan de la rentabilité, notamment les nombreuses interruptions de service dues à des pannes mécaniques, le nombre peu élevé de clients qui ont choisi d'utiliser les services offerts (y compris des services contractuels pour des transports accessibles subventionnés) et la nécessité de suppléer au manque à gagner des chauffeurs des taxis accessibles, étant donné que ces derniers ne rapportent pas autant que les autres. A l'époque où l'enquête avait été faite, la plupart des enquêtés estimaient que la seule manière de rentabiliser le transport accessible serait par le truchement de services de transport subventionnés analogues à ceux assurés par le programme ParaTransp à Ottawa qui permet de suppléer au manque à gagner. Malgré cette aide financière, les entrepreneurs assurant des services de transport subventionnés constatent que les taxis accessibles ne sont toujours pas aussi rentables que les autres.

Comme il a été dit plus haut, ces résultats ne sont que ceux des quelques premiers mois d'exploitation. Des données plus récentes montrent que, en septembre 1990, il y avait en Ontario 23 entrepreneurs disposant d'un total de 52 taxis accessibles desservant 29 municipalités. Ainsi, le programme, tout en marquant un succès notable dans l'implantation des taxis accessibles en Ontario, n'a cependant pas réussi à implanter dans

aucune de ces collectivités des taxis accessibles à hauteur du nombre qui eût permis de vérifier à fond le bien-fondé du concept préconisé.

2.2 Le matériel

Transports Canada, ayant fait l'acquisition des quatre véhicules destinés à la démonstration, les a remis à la Blue Line Taxi pour qu'ils y soient appropriés au service envisagé. Mais cette dernière ayant fait remarquer que des modifications étaient nécessaires avant leur mise en service, Transports Canada a pris les dispositions voulues dans ce sens.

Les deux types de véhicules ont fait l'objet d'une étude ergonomique portant autant sur l'insuffisance de leurs aménagements que sur leur fonctionnement. Cette étude a fait appel à des enregistrements magnétoscopiques montrant des chauffeurs en train d'installer des passagers handicapés pourvus d'aides à la mobilité de différentes sortes; ces bandes vidéo ont permis d'identifier certaines faiblesses, liées surtout à l'utilisation de la rampe dans le cas du véhicule à pavillon surélevé, et à l'ancrage des aides à la mobilité (difficultés d'ancrage ou lacunes dans les procédures établies, surtout lorsque ces aides sont dépourvues de points de fixation apparents ou adéquats). L'étude a également fait ressortir l'insuffisance ou le manque de formation des chauffeurs qui s'y prenaient mal pour installer leurs passagers handicapés et pour immobiliser les aides à la mobilité. Cette étude a recensé une vingtaine de détails importants dans l'aménagement des taxis accessibles concernant la rampe, les dispositifs d'ancrage et d'immobilisation, l'aménagement intérieur et autres caractéristiques générales.

Les chauffeurs s'en prenaient surtout au pavillon surélevé qui, à leurs yeux, enlaidissait le véhicule et donnait à celui-ci un aspect très éloigné de celui auquel s'attend un client éventuel cherchant à héler un taxi dans la rue.

Les clients ont été invités à donner leur avis concernant les deux types de véhicules. Une mise en garde s'impose ici : il faut user de prudence à l'égard des opinions ainsi exprimées et qui peuvent avoir été influencées par le chauffeur. Il ressort que les clients non handicapés préfèrent le véhicule à pavillon surélevé en raison de son aménagement

intérieur, sa tenue de route et son confort, alors que les clients handicapés le préfèrent pour sa tenue de route, seulement. Quant au véhicule à plancher surbaissé, les premiers n'ont fait état d'aucune préférence particulière, alors que les seconds le trouvent préférable à l'autre en raison de l'emplacement réservé au fauteuil roulant, la sécurité des ancrages et la faible inclinaison de la rampe.

Les rapports remis par les chauffeurs montrent qu'un des véhicules de chaque type a connu de nombreuses pannes nécessitant de grandes réparations et causant de longues interruptions de service durant la première année d'exploitation qui correspond à la période de la démonstration. L'examen des rapports d'entretien de la Blue Line montre que, pour ce qui est des deux véhicules à plancher surbaissé, le coût de l'entretien régulier non couvert par la garantie s'est révélé égal ou inférieur à celui qu'ont dégagé nombre de taxis classiques servant de véhicules témoins. Une analyse semblable à l'égard des véhicules exploités par la A-1 Taxi n'a pu être faite à cause des lacunes dans les dossiers d'entretien tenus par cette société.

Les chauffeurs et les cadres des deux entrepreneurs sont d'avis que ni l'un ni l'autre véhicule n'est apte à servir pendant longtemps comme taxi accessible. Ils estiment que le châssis, emprunté à la fourgonnette Chrysler, n'a pas la robustesse exigée d'un véhicule devant servir de taxi et que ni la qualité du produit, ni la nature du travail, ni la tenue à la rouille de ces véhicules ne les rendent aptes à servir longtemps à cet usage.

Tout concourt à montrer la supériorité du véhicule à plancher surbaissé sur l'autre : l'avis des clients, des chauffeurs, des cadres ainsi que le résultat de l'évaluation ergonomique. Cependant, force est de constater que le véhicule qui a servi à la démonstration laisse encore beaucoup à désirer sur le plan de la tenue de route et de l'aménagement intérieur, aux yeux des clients non handicapés. Là-dessus, il faut se rappeler que ces véhicules, achetés en 1988, sont représentatifs de ce qui pouvait s'obtenir sur le marché à cette époque. Il est possible que des véhicules plus modernes obtiennent un verdict plus favorable à l'issue de tests semblables, et que l'argumentation pour ou contre l'un ou l'autre type de véhicule n'ait plus sa raison d'être.

Il est évident que le succès du présent programme qui vise à transformer de fond en comble l'industrie du taxi dépend avant tout de l'existence d'un matériel qui réponde aux attentes et des clients et des entrepreneurs. Or, force est de constater que, en 1988, un tel matériel n'existait tout simplement pas au Canada.

2.3 Taxis accessibles et chauffeurs

Les deux entrepreneurs ont éprouvé des difficultés à recruter et à garder des volontaires pour conduire les taxis accessibles. En effet, comme il s'agissait d'un service nouveau et d'un matériel hors norme, la charge de travail des chauffeurs était accrue. À aucun moment ils n'ont pu disposer d'une liste de candidatures, et il a été aussi difficile de trouver des remplaçants que de recruter des chauffeurs. Les volontaires finalement recrutés sont, de façon générale, d'âge mûr et proviennent souvent d'une famille qui compte une personne handicapée.

La formation des chauffeurs a été prise en charge par la Blue Line avec le concours du Centre de réadaptation d'Ottawa. Un examen du cours de formation montre qu'il a traité des tâches essentielles à accomplir à l'égard des clients handicapés et que sa qualité ainsi que son efficacité sont comparables à celles des autres cours dispensés ailleurs. Ce cours pourrait bien servir ailleurs au Canada à la formation de base de chauffeurs de taxis d'expérience appelés à conduire un véhicule adapté. Mais la démonstration a souligné la nécessité d'un recyclage permanent des chauffeurs qualifiés. On a également remarqué que les remplaçants, avant de prendre en charge un véhicule accessible, ne recevaient que des instructions sommaires de la part des chauffeurs partants, ce qui est inadmissible. Seuls les chauffeurs ayant reçu une formation suffisante doivent être autorisés à conduire un taxi accessible et à venir en aide aux clients handicapés.

On a observé que les chauffeurs qui, au début, s'enthousiasmaient pour leur travail, en perdaient vite le goût. Au bout d'une année, tous les chauffeurs recrutés avaient quitté, sauf un. Les raisons avancées par certains chauffeurs étaient d'ordre médical ou reliées à la santé. Mais, pour la plupart, ils ont invoqué les trois raisons suivantes :

1.La démonstration a été organisée de telle manière qu'il incombait au chauffeur d'expliquer la nature du service, d'en faire la promotion auprès des personnes handicapées et de tenir un carnet de route.

2.Le temps consacré à venir en aide aux clients handicapés occasionnait un manque à gagner que rien ne permettait de combler.

3.Certains aspects du travail, tels que la responsabilité civile qui leur incombe, l'aspect et la tenue de route des véhicules (surtout ceux à pavillon surélevé) et les longues interruptions de service nécessitées par les réparations.

Une des principales causes de l'insatisfaction éprouvée par les chauffeurs des taxis accessibles est liée à la faible durée de la démonstration. A mesure que les véhicules s'amélioreront et qu'ils deviendront plus fiables, une autre cause d'insatisfaction se résorbera d'elle-même. Mais une des choses apprises grâce à la démonstration a été l'importance qu'il faudra accorder au recrutement des chauffeurs et à leur « fidélisation » une fois qu'ils se seront montrés aptes à conduire un taxi accessible. En effet, cette tâche exige un dévouement à la clientèle qui n'a aucune commune mesure avec ce qui est attendu des autres chauffeurs. Il faut beaucoup de temps et d'argent à un entrepreneur pour former un bon chauffeur, et à ce dernier beaucoup d'efforts pour apprendre comment manoeuvrer et immobiliser la grande variété d'aides à la mobilité en usage aujourd'hui. Chaque fois que le chauffeur d'un taxi accessible demande sa mutation, la productivité du service s'en ressent fortement. D'où la nécessité d'un programme pour le recrutement et la « fidélisation » de bons chauffeurs, faute de quoi le succès d'un service de taxis accessibles risque d'être compromis.

2.4 Taxis accessibles et usagers

L'enquête de base sur la population handicapée d'Ottawa a dégagé le profil de l'usager type et des volontaires ont été chargés d'inscrire dans un carnet de route les déplacements qu'ils font par divers moyens, y compris les taxis accessibles. Les résultats sont à la mesure des moyens de transport dont dispose la population handicapée d'Ottawa, grâce à ParaTranspo et à d'autres initiatives privées, mais les besoins restent criants. Une des constatations faites par ce volet de l'enquête a été que près de la moitié des déplacements effectués par les volontaires dans un taxi accessible auraient été annulés, faute de ce type de véhicule. La

démonstration met en évidence la grande amélioration que les taxis accessibles apportent au chapitre de l'autonomie des personnes handicapées.

L'accueil des usagers, handicapés et non handicapés confondus, est très favorable à l'égard des taxis accessibles. Ils sont, pour la plupart, disposés à s'en servir de nouveau. Dans les lettres qu'ils écrivent, ils favorisent ce service et félicitent les entrepreneurs qui le proposent. Les quelques commentaires défavorables exprimés s'expliquent par le fait que ceux qui les ont faits n'avaient pas encore bien compris que ce service ne s'adresse pas uniquement à la population handicapée. Mais, avec plus de publicité et de véhicules sur la route, ce malentendu finira par se dissiper.

L'information fournie par les volontaires confirme les prévisions de l'enquête concernant la demande pour un tel service. Un tiers des personnes en fauteuil roulant ou à mobilité réduite ont déclaré qu'elles n'auraient pas effectué le déplacement si les taxis accessibles n'avaient pas été disponibles. Huit pour cent seulement des usagers non handicapés ont été de cet avis. Il est plus que probable que les usagers souffrant d'incapacité se serviront de ce taxi moins souvent que les usagers non handicapés pour se rendre à leur travail ou pour d'autres motifs de cette nature, mais qu'ils l'utiliseront davantage pour aller magasiner ou pour des motifs reliés à la santé ou aux loisirs.

2.5 Évaluation économique

2.5.1 Marché potentiel

Les résultats de l'enquête de base montrent qu'Ottawa constitue un débouché très intéressant pour les taxis accessibles. Par extrapolation des résultats en fonction de la population totale de cette ville, on estime que 900 personnes atteintes d'incapacité utiliseront certainement ce service, et que 2 100 autres l'utiliseront probablement. Une interprétation prudente des résultats dégage un marché potentiel de quelque 2 000 usagers à Ottawa.

A supposer que les habitudes de déplacement de la population handicapée d'Ottawa soient les mêmes que pour le reste du pays, chaque personne handicapée effectuera un peu plus de trois déplacements en taxi par mois. L'examen du carnet de route des chauffeurs ayant participé à la démonstration montre que les déplacements effectués par des usagers atteints d'incapacité s'élèvent à quelque 12 p. 100 du nombre total de déplacements. Ce chiffre indique que, pour répondre à la demande initiale pour des services de taxis adaptés, il faudra un parc de quelque 50 véhicules accessibles fonctionnant à raison de deux postes par jour. Les autres services de transport adapté, ParaTranspo à Ottawa, par exemple, doivent répondre à une croissance soutenue de la demande de la part d'une population handicapée relativement stable en nombre. Ce qui porte à croire qu'Ottawa pourra constituer un débouché plus intéressant que ne l'indiquent les prévisions basées surtout sur les résultats de la démonstration.

Sans les taxis accessibles, certains des déplacements effectués par des usagers handicapés n'auraient pu se faire. Il s'ensuit que l'adjonction de taxis accessibles au parc roulant nécessitera la délivrance de nouvelles licences d'exploitation pour répondre à la demande accrue, sans pour autant modifier le niveau actuel de service. En tenant compte seulement de ces quelques déplacements supplémentaires, les résultats de la démonstration montrent que, pour y faire face, le parc de taxis desservant Ottawa devra être augmenté de quatre véhicules, pour commencer.

2.5.2 Rentabilité des taxis accessibles : point de vue des chauffeurs

Il est possible que les usagers aient eu l'impression que l'entreprise A-1, avec son système de régulation en phonie plus souple dans son fonctionnement, transporte une proportion d'usagers handicapés plus élevée que l'autre entreprise, la Blue Line, avec son système de régulation informatisé. Or, l'examen des carnets de route révèle tout autre chose. Il révèle que les réservations et les clients pris en charge dans la rue représentent, chez Blue Line, 13 p. 100 environ du nombre total de déplacements effectués par des usagers handicapés, comparativement aux 12 p. 100 réalisés par les chauffeurs d'A-1. En tout, les quatre taxis accessibles ont assuré une moyenne de 12 p. 100 de tous les déplacements effectués par des usagers handicapés, sur les quelque 5 000 inscrits dans les carnets de route durant la démonstration.

Une analyse ergonomique et la mesure des temps et mouvements ont permis de calculer que les chauffeurs consacrent près de 6 min 30 s à installer les clients. Mais les notes prises par les volontaires montrent que, grosso modo, ce serait plutôt 10 minutes qu'ils mettent, compte tenu du temps qu'il faut pour la prise en charge du client, souvent à sa porte, et pour toutes les autres tâches qui n'ont rien à voir à la conduite. Bref, il se peut que les chauffeurs consacrent une quinzaine de minutes par appel pour aider leurs clients - temps sans contrepartie financière et constituant un manque à gagner pour les chauffeurs.

Il est possible, en revanche, que cet état de choses s'améliore eu égard aux habitudes de déplacement des usagers handicapés. En effet, il a été constaté que ces derniers effectuent des déplacements de plus grande durée que les autres usagers, et qu'ils préfèrent se déplacer aux heures creuses, quand la circulation est plus fluide. En d'autres termes, à un moment de la journée où les taxis classiques sont moins sollicités. Ce sont là deux facteurs qui permettraient aux chauffeurs de taxis accessibles de combler le manque à gagner qu'ils craignent tant.

Néanmoins, il est possible que les chauffeurs continuent d'avoir l'impression de subir un manque à gagner et de se plaindre, oublieux des deux facteurs compensateurs précités dont l'effet n'est pas toujours très évident pour eux. Donc, quand bien même les chiffres montrent que transporter des personnes handicapées devrait rapporter presque autant que transporter des personnes non handicapées, les chauffeurs n'en seront pas convaincus pour autant.

Les taxis accessibles transportant des personnes non handicapées devraient afficher des recettes comparables à celles des taxis classiques. L'examen des carnets de route tenus par les chauffeurs de la Blue Line (exploitant des taxis accessibles à plancher surbaissé) fait état de recettes comparables à celles des taxis témoins partageant le même poste qu'eux. Vu que les taxis témoins de la A-1 n'ont produit aucune information statistique, il a été impossible de dire si les chauffeurs de taxis à pavillon surélevé ont raison lorsqu'ils affirment que leurs véhicules sont moins souvent hélés dans la rue que les taxis classiques. Ce que la démonstration a montré, c'est qu'un taxi dont l'aspect n'a pas été profondément modifié - le taxi à plancher surbaissé, par exemple -n'aura pas autant de difficulté à se faire

héler. Il est possible que les usagers finissent par s'habituer, mais il reste que moins l'aspect du véhicule est insolite, moins ils hésiteront à le héler. Pour le chauffeur, il y aura moins de risques à se voir écarté en faveur d'un autre taxi et, donc, moins de risque de manque à gagner.

A long terme, et à mesure que les taxis accessibles circuleront en plus grand nombre, leur exploitation devrait finir par rapporter presque autant qu'un taxi classique. Mais l'impression de manque à gagner persistera aux yeux des chauffeurs, pour les deux raisons suivantes : l'aspect et l'apparence générale du taxi accessible qui limitent le nombre d'appels de clients dans la rue, et le temps perdu à aider les clients handicapés à s'installer.

La démonstration a bel et bien montré que, dans le but d'accroître la proportion de taxis accessibles dans un parc de taxis, il faudra recruter des chauffeurs disposés et aptes assurer un tel service. Or les difficultés éprouvées par les deux entreprises à recruter des chauffeurs et les demandes fréquentes de mutation, même parmi les chauffeurs dûment formés, montrent à quel point un service de taxis inhabituel comme celui du transport des personnes handicapées est à la merci de l'idée que s'en font les chauffeurs et du risque financier qu'ils y associent. Et pourtant, d'après les prévisions à moyen terme du marché ouvert aux taxis accessibles à Ottawa, il faudra recruter une centaine de chauffeurs. Ce chiffre ne pourra être atteint que dans la mesure où les fausses perceptions et la crainte de manque à gagner de ces chauffeurs auront été dissipées.

2.5.3 Rentabilité des taxis accessibles : point de vue de l'entreprise

Pour l'entreprise qui veut se lancer dans le transport adapté, des coûts accessoires sont à prévoir pour adapter le système de régulation en conséquence. Lorsque, comme chez Blue Line, ce système est informatisé, les coûts risquent d'être plus élevés en raison des immobilisations ou des perfectionnements à consentir.

Les taxis accessibles utilisés pour la démonstration ayant été achetés neufs, ils ne devaient pas coûter cher à l'entretien. Les résultats ont montré que tel était le cas. Mais des interruptions de service ont eu lieu, occasionnées par d'importantes réparations sous garantie dans un taxi à plancher surbaissé, et par les modifications apportées au pavillon

surélevé d'un autre. Les entreprises devraient donc s'attendre à un manque à gagner du au fait que les taxis accessibles risquent d'avoir une fiabilité moins élevée que les taxis classiques. Ce risque peut retomber dans une certaine mesure sur les chauffeurs aussi, bien qu'il leur soit possible de louer un autre véhicule en attendant que le leur soit réparé.

La démonstration a montré que le fait d'offrir des services de transport adapté contribue à améliorer l'image de marque aux yeux des usagers. Comme les personnes non handicapées appuient sans réserve les services accessibles, il se pourrait que les taxis classiques de l'entreprise en profitent tout autant par effet d'entraînement.

Pour l'entreprise de taxis qui envisage de se lancer dans le transport adapté, la première difficulté à résoudre est celle du financement des véhicules, car un véhicule adapté coûte entre 10 000 et 20 000 $ de plus qu'un taxi classique, après subvention provinciale. Dans le cas de la démonstration, les entreprises ne devaient pas s'attendre à récupérer les surcoûts qu'elles avaient consenti à prendre à leur charge. Dans ces conditions, elles ne sont guère intéressées à convertir une partie de leur parc roulant en véhicules accessibles. Il faut donc prévoir des moyens destinés à les y encourager, soit par des allégements financiers tels que subventions plus généreuses, soit en leur permettant de proposer de nouveaux services que les véhicules accessibles seraient autorisés à exploiter.

2.6 Résultats opérationnels

Après avoir mis en exploitation temporaire les deux taxis à pavillon surélevé, la société Blue Line a décidé de les abandonner. Transports Canada s'est alors entremis pour que la société A-1 Taxi les prenne en charge dans le cadre de la démonstration, ce qui a permis la mise en place de deux modes d'exploitation parallèles : Blue Line qui, à cause de son système de régulation informatisé, s'accommodait mal du service de taxis accessibles, et A-1 qui, avec un système en phonie, était prête à faire la promotion du taxi accessible et d'en réussir la démonstration. Exploitation banalisée, dans le premier cas, et exploitation avec valorisation et promotion.

Le programme de démonstration lancé à Ottawa a permis de comprendre qu'un service de taxis accessibles ne pourra réussir son intégration dans un parc de taxis classiques que dans la mesure où le système de régulation en place aura été adapté au nouveau service et dans la mesure où les téléphonistes et les régulateurs auront été formés pour recevoir et traiter comme il se doit les appels de la clientèle à mobilité réduite ou handicapée.

Tout au long du programme de démonstration, la fiabilité des taxis accessibles n'a cessé d'inquiéter, car, avec seulement quatre de ces véhicules en service régulier sur 1 000 taxis classiques, on ne pouvait répondre qu'à une très petite partie de la demande. La leçon à tirer est que le service de taxis accessibles doit, avant de pouvoir prendre de l'expansion, avoir maîtrisé les facteurs de disponibilité et de fiabilité. Il ne doit jamais être permis qu'un client handicapé, pris en charge à l'aller, ne puisse l'être pour le retour, pour motif de panne mécanique. De l'avis des sociétés de taxis, pour fournir un minimum de service de qualité acceptable, le service de taxis accessibles doit pouvoir compter sur au moins une vingtaine de ces véhicules, fonctionnant toute la journée à raison de deux postes par jour, ce qui sous-entend un effectif d'une quarantaine de chauffeurs disponibles. Un nombre trop faible de véhicules et des temps d'attente trop longs n'atténueront en rien le malaise et les frustrations manifestement ressentis par la clientèle et les entrepreneurs durant la démonstration. Un constat d'échec en sera la conséquence.

2.7 Conclusions pratiques

L'étude sur l'intégration de taxis accessibles dans un parc de taxis classiques, dans un cadre opérationnel voulant qu'ils servent principalement à transporter des clients non handicapés et, en appoint mais sans diminution du niveau de service, des personnes handicapées ou à mobilité réduite qui en font la demande, a montré à quel point un tel service était nécessaire, et combien utile pour éliminer les barrières entre la population handicapée et la collectivité. Tout en se défendant de vouloir imposer une marche à suivre en ce qui a trait aux politiques à mettre en place, les auteurs proposent des recommandations sur les possibilités de développement qui se présentent à l'issue de la démonstration, et notamment sur les sujets suivants :

2.7.1 Le véhicule approprié

Un service de taxis accessibles doit pouvoir compter sur un véhicule approprié, dont la fiabilité et le coût d'exploitation sont comparables à ceux d'un taxi classique. Or, le véhicule mis en service durant la démonstration n'a pas été à la hauteur. Il reste donc à réaliser le véhicule approprié, soit par conversion à partir d'un véhicule standard existant, soit étudié exprès.

2.7.2 La formation et la « fidélisation » des chauffeurs

L'étude révèle qu'un chauffeur de taxi chevronné qui, ayant à choisir entre un taxi classique et un taxi accessible, finit par opter pour ce dernier, doit s'attendre à certains coûts de démarrage liés à la formation qu'il doit recevoir et au fait qu'il mettra un certain temps à se familiariser avec son travail. Et même lorsque cette période de rodage sera terminée, il subsistera une impression de manque à gagner à cause des temps sans contrepartie financière consacrés à assister les clients. Donc, aux yeux du chauffeur d'un taxi accessible, deux problèmes se posent :

1. Le coût d'entrée en service. Les chauffeurs devront accepter un manque à gagner temporaire, le temps qu'ils aient reçu la formation nécessaire et terminé la période de rodage inévitable. A défaut d'une compensation financière appropriée, il est peu probable de voir les chauffeurs abandonner un taxi classique pour un taxi adapté.
2. L'impression de subir un manque à gagner à cause du temps passé à aider les clients handicapés, impression que même les chauffeurs expérimentés continuent d'avoir.

Par ailleurs, il ressort de l'étude que les revenus des chauffeurs et la qualité du service sont étroitement liés au taux de roulement des chauffeurs, qui doit demeurer faible. Il faut donc adopter une politique de compensation financière pour les coûts de démarrage dont il a été question plus haut. Bien que les chercheurs ne se soient pas penchés sur les implications d'une telle politique, ils proposent qu'elle soit structurée selon les grandes lignes suivantes :

1. Exiger des chauffeurs chevronnés qu'ils suivent un cours de formation sur les taxis accessibles. A la lumière des résultats de la démonstration, il suffirait d'adapter le cours qui a servi à Ottawa.

2. Offrir aux chauffeurs chevronnées une compensation financière pour le manque à gagner durant la période de formation et les premières semaines de service durant lesquelles il se familiarisera avec son travail.

3. Interdire à quiconque n'a pas suivi le cours prescrit de conduire un taxi accessible, et ce pour des raisons générales de sécurité, celle des passagers et du véhicule, ainsi que du chauffeur lui-même.

4. Si, à l'intérieur d'un certain laps de temps, disons deux ans, le chauffeur d'un taxi accessible désire revenir au taxi classique, lui réclamer le remboursement de la subvention dont il a bénéficié pendant qu'il était au volant d'un taxi accessible. Cette récupération pourrait être proportionnelle au temps passé en service adapté, de manière à encourager le chauffeur à faire un essai d'une durée suffisante.

Cette politique a l'avantage de satisfaire à certaines exigences que la campagne de démonstration avait mises en évidence :

1. Nécessité de donner aux chauffeurs une formation adéquate quant aux procédures à suivre, notamment celles qui ont trait à l'ancrage des aides à la conduite et à l'immobilisation de passagers, de manière à éviter de leur faire courir et de prendre eux-mêmes des risques inutiles.

2. Nécessité d'une période de rodage qui permette aux chauffeurs formés de se familiariser avec leur travail, de se créer une façon de travailler qui tire parti du véhicule et du marché en puissance et de se faire une idée des profits qu'ils pourront en tirer. L'avantage de cette tactique est de garder relativement faible la proportion de chauffeurs voulant revenir aux taxis classiques.

3. Nécessité de compensations financières durant la période de formation et de rodage pour les chauffeurs qui optent pour le taxi accessible, favorisant ainsi le recrutement qui avait posé tant de difficultés au moment du lancement de la campagne de démonstration.

2.7.3 Immobilisations

La première barrière à l'intégration rapide des taxis accessibles dans le parc de taxis classiques est d'ordre financier. Même subventionnés, les taxis accessibles coûtent plus cher que les taxis classiques. Les entreprises ne devront pas s'attendre à récupérer les surcoûts consentis à même les recettes des chauffeurs étant donné que ceux-ci, menacés de manque à gagner, ne seront certes pas disposés à assumer des frais de location ajoutés. Pourtant, selon la méthode de calcul utilisée, cette surcharge pourra varier entre 10 $ et 20 $ par jour. Deux solutions sont possibles :

1. Augmenter les subventions de manière à rendre le prix net d'un taxi accessible comparable à celui d'un taxi classique. Le montant de ces subventions diminuera à mesure qu'un nombre de plus en plus élevé de taxis classiques seront convertis en taxis accessibles et que le processus de conversion, l'expérience aidant, sera de plus en plus rentable.

2. Utiliser la délivrance de permis d'exploitation de taxi comme moyen d'encouragement à l'exploitation de taxis accessibles. Les municipalités accordent généralement un nombre limité de permis, avec la conséquence que la valeur de rachat des permis ne cesse d'augmenter. La possibilité serait donc que, pour obtenir un permis de taxi accessible, les entreprises de taxis soient requises de convertir en taxis accessibles un certain nombre des taxis classiques qu'elles exploitent.

Cette tactique sera difficile à mettre en oeuvre dans la mesure où les municipalités ne s'accordent guère sur les conditions requises pour délivrer des permis d'exploitation. A condition que les politiques en la matière puissent être harmonisées, elle apportera les avantages suivants :

1. La campagne a montré que dans la région d'Ottawa un taxi accessible sur dix servirait à absorber l'augmentation de la demande liée à l'existence même d'un tel service. Cette proportion pourrait servir de base de calcul pour la délivrance de nouveaux permis. Cependant, pour assurer une qualité adéquate du service, il faudra convertir un certain nombre des permis existants en permis d'exploiter des taxis accessibles de manière à agrandir le parc de taxis accessibles en service.

2. Il se peut que la stratégie des entreprises de taxis d'opter pour un accroissement des permis d'exploitation délivrés finisse par les encourager à se lancer dans le transport adapté, ce qui revient à préférer la voie des subventions à celle de la revente de permis au prix du marché.

Les responsables de la présente étude n'avaient pas pour mandat d'approfondir ces deux possibilités qui, cependant, pourraient constituer des mécanismes bon marché favorisant l'expansion rapide du service de taxis accessibles.

2.7.4 Collaboration entre entreprises de transport adapté

Un autre moyen de favoriser cette expansion est de coordonner les services offerts par les entreprises de taxis accessibles et les entreprises de transport adapté, l'avantage pour ces

dernières étant qu'elles n'auront plus à financer de nouveaux véhicules pour absorber l'augmentation de la demande.

1. Les taxis accessibles pourraient prendre en charge une partie de la clientèle aux heures de pointe, évitant aux services de transport adapté l'obligation d'accroître leur parc de véhicules pour répondre aux pointes de courte durée.

2. Dans ces conditions, les services de transport adapté pourraient se limiter à un seul poste par jour, sauf cas exceptionnels. Les autobus adaptés ayant une capacité qui semble supérieure à la demande durant les heures creuses, le taxi accessible serait plus approprié pour y répondre.

Prenant l'exemple d'Ottawa, si un taxi accessible était utilisé pour répondre à un appel enregistré auprès de ParaTranspo, il serait raisonnable que le passager ne paie que le tarif normalement exigé, cette dernière prenant à sa charge la différence par rapport au tarif indiqué sur le taximètre. Cette tactique serait à l'avantage de ParaTranspo qui pourrait ainsi réduire le nombre de ses véhicules en circulation ainsi que le nombre d'heures de service. A court terme, elle lui permettrait de réduire le nombre de véhicules en service aux heures creuses, réduisant les coûts d'exploitation; à long terme, l'apport des taxis accessibles lui permettra de reporter à plus tard l'acquisition de nouveaux véhicules. Pour les taxis accessibles, cette tactique augmenterait la recette des chauffeurs et de l'entreprise qui les emploie et compenserait une partie ou la totalité des surcoûts que celle-ci aurait pu avoir consentis.

En réalité, cette tactique de rentabilisation applique les revenus tirés du transport de personnes non handicapées en taxis accessibles au financement des immobilisations nécessaires pour assurer un service de transport adapté dans la collectivité. Il y aurait lieu de l'approfondir afin de pouvoir déterminer dans quelle mesure l'industrie du taxi classique pourra servir à subventionner le transport adapté, évaluer les avantages découlant pour les taxis accessibles et en connaître les incidences sur la clientèle des services de transport adapté et les entreprises en question.

APPENDIX A

RESEARCH PLAN
PRSENTED AND APPROVED AS PART OF THE
STUDY DEFINITION REPORT
PREPARED BY STEVENSON & KELLOGG ERNST & WHINNEY AND
ABT ASSOCIATES OF CANADA

FEBRUARY 1989

EXHIBIT II-1: RESEARCH PLAN

PROJECT GOAL AND SUB-GOALS	EVALUATION OBJECTIVES	DATA ITEM	DATA SOURCE	ANALYSIS FORMAT
Demonstrate and evaluate the use and integration of accessible taxis for the transportation of the mobility impaired in an Ottawa taxi fleet, including general service and airport dispatches.				
Assess the economic viability of an accessible taxi service integrated in a taxi fleet	1 Measure the amount of time and mileage used by the test vehicles for the transportation of disabled riders and express this value as a portion of the total time and mileage in service.	Number of trips and time of each trip for disabled riders	Dispatch computer records, showing trips accepted for disabled riders	Calculate total number of trips and time for trips made with disabled riders
		Number of trips and total time for trips for regular riders	Dispatch computer records, showing trips accepted for regular riders and non-dispatched trips completed by accessible taxis	Estimate of trips and time for disabled riders as proportion of total trips and time for accessible taxis
		Time from arrival at dispatched address to assist disabled rider into accessible taxi and from arrival at destination to assist disabled rider out of accessible taxi	Ergonomics study task analysis	Estimate of standardized driving time for accessible taxi serving disabled and regular passengers as a proxy for the distance travelled on these trips: - Total time meter on for trip with disabled rider less typical time while meter on to assist the disabled rider into and out of the accessible taxi - paid km. for disabled riders as proportion of total paid km. of accessible taxis
		Typical driver practice for turning taxi meter on and off when assisting a disabled passenger	Ergonomics study Driver quarterly meetings Test rider diaries	

EXHIBIT II-1: RESEARCH PLAN

PROJECT GOAL AND SUB-GOALS	EVALUATION OBJECTIVES	DATA ITEM	DATA SOURCE	ANALYSIS FORMAT
	4 Study the financial ramifications of the use of accessible taxis: - to the driver	Number of trips per week and average time per trip for accessible and comparison taxis, for each of: - dispatch trips accepted for disabled riders - dispatch trips accepted for regular riders - pick-up trips accepted	Dispatch computer records: - dispatch calls accepted - non-dispatch trips accepted (Assumes the "cheat switch" removed and the computer logs all fares showing accurate time on and off for the taxi meter)	Estimate the average time per trip for disabled riders in accessible taxis (estimate time to assist disabled rider) Estimate difference in net return to driver per week for accessible and regular taxis, considering: - proportion of disabled and able-bodied riders served by accessible taxis - proportion of paid and unpaid standardized time for trips with disabled riders and regular riders (ie. difference in dead-head km. to pick-up) - operating cost per week to driver of each type of accessible taxi and comparison taxis
	- to the company	Operating statistics for accessible and comparison taxis: - driver turnover - driver training - maintenance costs for basic vehicle - Maintenance costs for vehicle and modifications Capital costs after subsidies and financing costs for regular and	Blue Line cost, maintenance and personnel records	Comparison of accessible and regular taxis: - operating cost to the company per km. - net capital and financing costs - estimated rental income per year - net return to the company per year

APPENDIX B

BASELINE SURVEY QUESTIONNAIRE

SHOWING SUMMARY DATA

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+---+---+---+---+

Telephone number

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Business Telephone number

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Preferred place to be interviewed

MONDAY	11	31%	36
TUESDAY	8	22%	
WEDNESDAY	7	19%	
THURSDAY	2	6%	
FRIDAY	3	8%	
SATURDAY	2	6%	

Preferred place to be interviewed

HOME	41	95%	43
WORK	0	0%	

Preferred time to be interviewed

MORNING	16	44%	36
AFTERNOON	12	33%	
EVENING	8	22%	

Directory entry

+-+-+-+-+-+-+-+-+-+-+-+-+

SMP TYPE

TELEPHONE BOOK	101	70%	144
REFERRAL	7	5%	
CLIENT LIST	36	25%	

Chance of getting cooperation at another time?

Very likely	0	0%	36
Fairly likely	0	0%	
Not very likely	0	0%	
Not at all likely	0	0%	
(DON'T KNOW)	0	0%	

Result Of Last Call

01 Completed Interview	144	100%	144
02 Number Engaged	0	0%	
03 No Answer	0	0%	
04 Appointment	0	0%	
05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
7	0	0%	
8	0	0%	
9	0	0%	
10	0	0%	
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12	0	0%	
13	0	0%	
14	0	0%	
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16	0	0%	
17	0	0%	
18	0	0%	
19	0	0%	
20	0	0%	
21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem	0	0%	
31 Terminated (Other Reasons)	0	0%	

exit Variable

01 Completed Interview	0	0%	2
02 Number Engaged	0	0%	
03 No Answer	0	0%	
04 Appointment	1	50%	

05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
7	0	0%	
8	0	0%	
9	0	0%	
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16	0	0%	
17	0	0%	
18	0	0%	
19	0	0%	
20	1	50%	
21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem,	0	0%	
31 Terminated (Other Reasons)	0	0%	

total Number Of Calls To This Number

1	77	53%	144
2	27	19%	
3	24	17%	
4	11	8%	
5	3	2%	
6	2	1%	
7	0	0%	
8	0	0%	
9	0	0%	
10	0	0%	
11	0	0%	
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16	0	0%	
17	0	0%	
18	0	0%	
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21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25	0	0%	
26	0	0%	
27	0	0%	
28	0	0%	
29	0	0%	
30 PLUS	0	0%	

Record Of Call WHY WAS THE INTERVIEW TERMINATED?

01 Completed Interview	77	58%	133
02 Number Engaged	6	5%	
03 No Answer	35	26%	
04 Appointment	14	11%	
05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
7	0	0%	
8	0	0%	
9	0	0%	
10	0	0%	

11	0	0%	
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20	0	0%	
21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem	1	1%	
31 Terminated (Other Reasons)	0	0%	

Record Of Call WHY WAS THE INTERVIEW TERMINATED?

01 Completed Interview	27	44%	62
02 Number Engaged	3	5%	
03 No Answer	29	47%	
04 Appointment	3	5%	
05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
7	0	0%	
8	0	0%	
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10	0	0%	
11	0	0%	
12	0	0%	
13	0	0%	
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21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem	0	0%	
31 Terminated (Other Reasons)	0	0%	

Record Of Call WHY WAS THE INTERVIEW TERMINATED?

01 Completed Interview	24	63%	38
02 Number Engaged	3	8%	
03 No Answer	11	29%	
04 Appointment	0	0%	
05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
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9	0	0%	
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21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem	0	0%	
31 Terminated (Other Reasons)	0	0%	

Record Of Call WHY WAS THE INTERVIEW TERMINATED?

01 Completed Interview	11	69%	16
02 Number Engaged	1	6%	
03 No Answer	3	19%	
04 Appointment	1	6%	
05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
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19	0	0%	
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21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem	0	0%	
31 Terminated (Other Reasons)	0	0%	

Record Of Call WHY WAS THE INTERVIEW TERMINATED?

01 Completed Interview	3	60%	5
02 Number Engaged	1	20%	
03 No Answer	1	20%	
04 Appointment	0	0%	
05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
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21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem	0	0%	
31 Terminated (Other Reasons)	0	0%	

Record Of Call WHY WAS THE INTERVIEW TERMINATED?

01 Completed Interview	2100	%	2
02 Number Engaged	0	0%	
03 No Answer	0	0%	
04 Appointment	0	0%	
05 NO DISABLED ADULT IN HOUSEHOLD	0	0%	
06 ALREADY BEEN CONTACTED	0	0%	
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8	0	0%	
9	0	0%	
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13	0	0%	
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17	0	0%	
18	0	0%	
19	0	0%	
20	0	0%	
21	0	0%	
22	0	0%	
23	0	0%	
24	0	0%	
25 Quota Failure	0	0%	
26 Number Not In Service/business No	0	0%	
27 Initial Refusal	0	0%	
28 Respondent Broke Off	0	0%	
29 Respondent Never Available	0	0%	
30 Language Problem	0	0%	
31 Terminated (Other Reasons)	0	0%	

Record Of Call WHY WAS THE INTERVIEW TERMINATED?

01 Completed Interview	0	-	0
02 Number Engaged	0	-	
03 No Answer	0	-	
04 Appointment	0	-	
05 NO DISABLED ADULT IN HOUSEHOLD	0	-	
06 ALREADY BEEN CONTACTED	0	-	
7	0	-	
8	0	-	
9	0	-	
10	0	-	
11	0	-	
12	0	-	
13	0	-	
14	0	-	
15	0	-	
16	0	-	
17	0	-	
18	0	-	
19	0	-	

20	0	-
21	0	-
22	0	-
23	0	-
24	0	-
25 Quota Failure	0	-
26 Number Not In Service/business No	0	-
27 Initial Refusal	0	-
28 Respondent Broke Off	0	-
29 Respondent Never Available	0	-
30 Language Problem	0	-
31 Terminated (Other Reasons)	0	-

QUOTA VARIABLE

1	144	100%	144
2	0	0%	
3	0	0%	

6-JUN-89 %h

Your next call is to:

Telephone Number (HOME) : %2.
Telephone Number (WORK) : %3.
Respondent Name : %7.

Sample Type : %8.

Appointment details (if any): 0

Number of Previous Diallings: %371;
Result of Last Call : %10.

%373,/Chance of Future Co-operation: // %375,9.

6-JUN-89 %h

Your next call is to:

Telephone Number : %2.
Respondent Name : %7.

Sample Type : %8.

Appointment details (if any): 0

Number of Previous Diallings: %378;
Result of Last Call : %10.

%380,/Chance of Future Co-operation: // %382,9.

ID

144 54

BSN1

144 5249

TIME STAMP1

144 127

ID

144 1078

BSN

144 210874

N CALLS

144 2

DATETIME

PN

144 53

CLT

TORONTO	144	100%	144
VANCOUVER	0	0%	
EDMONTON	0	0%	
CALGARY	0	0%	
WINNIPEG	0	0%	
LONDON	0	0%	
HAMILTON	0	0%	
MONTREAL	0	0%	
QUEBEC	0	0%	

HALIFAX..... 0 0%

Main Questionnaire Time Stamp

+--+--+--+--+--+ 144 1085

Hello, my name is %N . I am with Canadian Facts. We are conducting a survey for Transport Canada and the Ontario Ministry of Transportation. The purpose of the study is to obtain information on the transportation needs and experiences of disabled persons living in the Ottawa area.

For this study, we want to talk to people with a long-term disability.

READ IF NECESSARY:
By disability we mean any condition or health problem lasting 6 months or more that restricts the individual's ability to get around in the community. This might include people with hearing or vision disabilities as well as people with mobility-agility problems or other problems.

JUST PRESS RETURN AND
CONTINUE READING..... 74 51% 144

Are there any disabled adults living in this household ?
BEDRIDDEN AND HOUSEBOUND ALSO QUALIFY HERE

YES, RESPONDENT..... 127 88% 144

YES, CONTINUE..... 17 12%

NO DISABLED ADULTS..... 0 0%

ALREADY BEEN CONTACTED... 0 0%

INITIAL REFUSAL..... 0 0%

NO ANSWER..... 0 0%

BUSY..... 0 0%

NOT IN SERVICE..... 0 0%

OTHER (TERMINATE)..... 0 0%

APPOINTMENT..... 0 0%

LANGUAGE PROBLEM..... 0 0%

| Thank you for your time. Goodbye. |

| Thank you for your time. Goodbye. |

Main Questionnaire Time Stamp

+--+--+--+--+--+ 144 1088

Q1. Do any other disabled adults live in this household?
%N
BEDRIDDEN AND HOUSEBOUND ALSO QUALIFY HERE

Yes..... 21 17% 127

No..... 106 83%

Refused..... 0 0%

Q1A. Is there more than one disabled adult living in this household ?

YES..... 1 6% 17

NO..... 16 94%

REFUSED..... 0 0%

Q1B. Would it be possible to speak to a disabled adult that lives in this household.

PROBE: If He/She is unable to communicate or come to the phone a suitable Proxy would do just fine.

Or I can call back later if this is not a convenient time.

CONTINUE WITH PROXY..... 12 71% 17

CONTINUE WITH RESPONDENT. 5 29%

ARRANGE CALLBACK..... 0 0%

REFUSED TO PARTICIPATE... 0 0%

| Hello, my name is %N . I am with Canadian Facts. We are conducting a survey for Transport Canada and the Ontario Ministry of Transportation. The purpose of the study is to obtain information on the transportation needs and experiences of disabled persons living in the Ottawa area. |

Q1C.I would like to ask a few questions about %418,/the/your/ disability.
I can call back later if this is not a convenient time.

CONTINUE WITH RESPONDENT. 132100% 132

ARRANGE CALLBACK..... 0 0%

REFUSED TO PARTICIPATE... 0 0%

Q2. What is the nature of %424,/the/your/ disability?

VISION IMPAIRED..... 13 9% 144

HEARING IMPAIRED..... 4 3%

SPEECH IMPAIRED..... 8 6%

MOBILITY/AGILITY IMPAIRED 127 88%

OTHER (MENTALLY HANDICAPPED ETC.)..... 12 8%

Q3. %429,/Does he/she/Do you/ use any special aids or assistive devices as a result of %431,/the/your/ disability?

ANYTHING NOT ON LIST ENTER AS OPEN-END

USES CANE..... 43 30% 144

USES WALKER..... 13 9%

USES CRUTCHES..... 7 5%

USES WHEELCHAIR OR SCOOTER..... 65 45%

USES HEARING AID..... 2 1%

TELECOMMUNICATIONS DEVICE FOR THE DEAF (TDD)..... 0 0%

USES SYMBOL BOARD..... 0 0%

USES WHITE CANE..... 3 2%

USES GUIDE DOG..... 0 0%

ALL OTHER..... 28 19%

11..... 0 0%

12..... 0 0%

13..... 0 0%

14..... 0 0%

15..... 0 0%

16..... 0 0%

17..... 0 0%

18..... 0 0%

DON'T KNOW..... 6 4%

OPEN..... 0 0%

Q4. %438,/Does he/she/Do you/ use a CANE occasionally or always?

OCCASIONALLY..... 20 47% 43

ALWAYS..... 23 53%

Q4. %442,/Does he/she/Do you/ use a WALKER occasionally or always?

OCCASIONALLY..... 5 38% 13

ALWAYS..... 8 62%

Q4. %446,/Does he/she/Do you/ use a CRUTCHES occasionally or always?

OCCASIONALLY..... 3 43% 7

ALWAYS..... 4 57%

Q4. %450,/Does he/she/Do you/ use a WHEELCHAIR OR SCOOTER occasionally or always?

OCCASIONALLY..... 13 20% 65

ALWAYS..... 52 80%

Q4. %454,/Does he/she/Do you/ use a HEARING AID occasionally or always?

OCCASIONALLY..... 0 0% 2

ALWAYS..... 2100%

Q4. %458,/Does he/she/Do you/ use a TELECOMMUNICATIONS DEVICE FOR THE DEAF (TDD) occasionally or always?

OCCASIONALLY..... 0 - 0

ALWAYS..... 0 -

Q4. %462,/Does he/she/Do you/ use a SYMBOL BOARD occasionally or always?

OCCASIONALLY..... 0 - 0

ALWAYS..... 0 -

Q4. %466,/Does he/she/Do you/ use a WHITE CANE occasionally or always?

OCCASIONALLY..... 2 67% 3

ALWAYS..... 1 33%

Q4. %470,/Does he/she/Do you/ use a GUIDE DOG occasionally or always?

OCCASIONALLY..... 0 - 0

ALWAYS..... 0 -

IF WHEELCHAIR/SCOOTER AT Q3 ANYTHING ELSE (Q3) GO TO Q7

Q5. %474,/Is he/she/Are you/ able to transfer from a wheelchair to the seat of a vehicle?

YES..... 49 75% 65

NO..... 16 25%

IF Q5 (YES)

Q6. %478,/Is he/she/Are you/ able to transfer alone or do you require assistance

TRANSFER ALONE..... 29 59% 49

TRANSFER WITH ASSISTANCE. 17 35%

DEPENDS ON THE VEHICLE... 3 6%

ALL RESPONDENTS

Q7. When %480,/he/she travels/you travel/, even for short distances, %482,/does he/she/do you/ typically need someone to accompany %484,/him/her/you/ ?

YES.....	53	37%	144
NO.....	91	63%	

Q8. I would now like to ask some questons about %486,/his/her/your/ personal travel within the Ottawa area -- say within a 50-mile (80 km) radius from your home. By travel we mean trips %488,/he/she/you/ might have taken locally - to shop, visit friends, see a doctor or go to work. These trips could be either as a passenger or a driver in either a private or other vehicle. %490,/Has he/she/Have you/ taken any such trips within the Ottawa area in the past year?
READ ...EXCLUDING "WALKING" TRIPS

YES.....	133	92%	144
NO.....	11	8%	

IF TAKEN TRIPS WITHIN PAST YEAR Q8(YES)

Q9. Now, I would like to know approximately how many of these trips were taken within the Ottawa area in the past month. One-way counts as one trip.
IF DON'T KNOW PROBE FOR AN APPROXIMATION

IF STILL DON'T KNOW ENTER ESCD

+--+--+--+	133	30

Q10. Which of the following modes of transportation, %494,/is he/she/are you/ ABLE to use with %496,/his/her/your/ disability?
%498,/is he/she/are you/ able to .....
READ LIST

Travel in a private vehicle as a driver.....	38	29%	133
Travel in a private vehicle as a passenger...	115	86%	
Travel by OC Transpo (Reg. Bus).....	23	17%	
Travel by Para Transpo service.....	88	66%	
Travel by regular taxi service.....	69	52%	
NONE OF ABOVE.....	1	1%	

IF Q9 0 AND NOT DK

You say that %505,/he/she has/you have/ taken %53. trips in the Ottawa area within the past month. How many of these trips were taken using each of the following modes of travel?

IF Q10 NOT PRIVATE VEHICLE AS A DRIVER

Q11 How many of the %53. trips were taken in a private vehicle driven by %510,/him/her/you/ ?

+--+--+--+	35	17

IF Q10 NOT PRIVATE VEHICLE AS A PASSENGER

Q12 How many of the %53. trips were taken in a private vehicle with %514,/him/her/you/ as a passenger?

+--+--+--+	106	5

IF Q10 NOT OC TRANSPO

Q13. How many of the %53. trips were taken by OC Transpo?

+--+--+--+	21	9

IF Q10 NOT PARA TRANSPO

Q14. How many of the %53. trips were taken by Para Transpo service?

+--+--+--+	83	22

IF Q10 NOT REGULAR TAXI SERVICE

Q15. How many of the %53. trips were taken by regular taxi service?

+--+--+--+	65	1

ALL RESPONDENTS SAYING MORE THAN 1 AT Q9

Considering %522,/his/her/your/ personal transportation needs, I would like you to rate various transportation methods available in the Ottawa area. Even though %524,/he/she/you/ may not use one or more of these modes of transportation, we would still like %526,/his/her/your/ impressions of them.

Q16. I would like you to rate private vehicles for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %529,/his/her/your/ opinion.
How do %531,/he/she/you/ rate PRIVATE VEHICLES for ...
Being comfortable for you to ride in ?

1	6	5%	121
	2	2%	
	1	1%	
	2	2%	
	9	7%	
	9	7%	
	15	12%	
	14	12%	
	20	17%	
10	36	30%	
DON'T KNOW/NOT APPLICABLE	7	6%	

Q16. I would like you to rate private vehicles for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %533,/his/her/your/ opinion.
How do %535,/he/she/you/ rate PRIVATE VEHICLES for ...
Being physically easy for you to get into and out of ?

1	6	5%	121
	6	5%	
	1	1%	
	2	2%	
	21	17%	
	10	8%	
	12	10%	
	24	20%	
	10	8%	
10	24	20%	
DON'T KNOW/NOT APPLICABLE	5	4%	

Q16. I would like you to rate private vehicles for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %537,/his/her/your/ opinion.
How do %539,/he/she/you/ rate PRIVATE VEHICLES for ...
Being affordable for you ?

1	7	6%	121
	7	6%	
	3	2%	
	4	3%	
	12	10%	
	10	8%	
	7	6%	
	11	9%	
	11	9%	
10	25	21%	
DON'T KNOW/NOT APPLICABLE	24	20%	

Q16. I would like you to rate private vehicles for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %541,/his/her/your/ opinion.
How do %543,/he/she/you/ rate PRIVATE VEHICLES for ...
Providing you with any assistance you require getting into and out of the vehicle ?

1	8	7%	121
	5	4%	
	4	3%	
	0	0%	
	10	8%	
	9	7%	
	9	7%	
	17	14%	
	11	9%	

10.....	35	29%
DON'T KNOW/NOT APPLICABLE	13	11%

Q16. I would like you to rate private vehicles for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %545,/his/her/your/ opinion.
How do %547,/he/she/you/ rate PRIVATE VEHICLES for ...
Being available when you need it ?

1.....	5	4%	121
.....	8	7%	
.....	2	2%	
.....	3	2%	
.....	10	8%	
.....	13	11%	
.....	2	2%	
.....	18	15%	
.....	11	9%	
10.....	34	28%	
DON'T KNOW/NOT APPLICABLE	15	12%	

Q16. I would like you to rate private vehicles for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %549,/his/her/your/ opinion.
How do %551,/he/she/you/ rate PRIVATE VEHICLES for ...
For getting you where you want to go on time ?

1.....	5	4%	121
.....	3	2%	
.....	2	2%	
.....	1	1%	
.....	10	8%	
.....	8	7%	
.....	5	4%	
.....	18	15%	
.....	15	12%	
10.....	44	36%	
DON'T KNOW/NOT APPLICABLE	10	8%	

Q16. I would like you to rate private vehicles for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %553,/his/her/your/ opinion.
How do %555,/he/she/you/ rate PRIVATE VEHICLES for ...
Being a satisfactory method of transportation for you ?

1.....	4	3%	121
.....	3	2%	
.....	3	2%	
.....	3	2%	
.....	14	12%	
.....	7	6%	
.....	3	2%	
.....	16	13%	
.....	17	14%	
10.....	40	33%	
DON'T KNOW/NOT APPLICABLE	11	9%	

Q16. I would like you to rate OC TRANSPO for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %557,/his/her/your/ opinion.
How %559,/would he/she/do you/ rate OC TRANSPO for ...
Being comfortable for you to ride in ?

.....			
.....	25	21%	121
.....	11	9%	
.....	9	7%	
.....	3	2%	
.....	7	6%	
.....	4	3%	
.....	2	2%	
.....	7	6%	
.....	2	2%	
.....	2	2%	
DON'T KNOW/NOT APPLICABLE	49	40%	

Q16. I would like you to rate OC TRANSPO for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %561,/his/her/your/ opinion.
How %563,/would he/she/do you/ rate OC TRANSPO for ...
Being physically easy for you to get into and out of ?

.....	32	26%	121
.....	15	12%	
.....	5	4%	
.....	5	4%	
.....	6	5%	
.....	4	3%	
.....	2	2%	
.....	3	2%	
.....	0	0%	
.....	2	2%	
DON'T KNOW/NOT APPLICABLE	47	39%	

Q16. I would like you to rate OC TRANSPO for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %565,/his/her/your/ opinion.
How %567,/would he/she/do you/ rate OC TRANSPO for ...
Being affordable for you ?

.....	6	5%	121
.....	4	3%	
.....	3	2%	
.....	0	0%	
.....	10	8%	
.....	6	5%	
.....	6	5%	
.....	15	12%	
.....	5	4%	
.....	8	7%	
DON'T KNOW/NOT APPLICABLE	58	48%	

Q16. I would like you to rate OC TRANSPO for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %569,/his/her/your/ opinion.
How %571,/would he/she/do you/ rate OC TRANSPO for ...
Providing you with any assistance you require getting into and out of the vehicle ?

.....	18	15%	121
.....	16	13%	
.....	2	2%	
.....	0	0%	
.....	5	4%	
.....	5	4%	
.....	3	2%	
.....	2	2%	
.....	3	2%	
.....	4	3%	
DON'T KNOW/NOT APPLICABLE	63	52%	

Q16. I would like you to rate OC TRANSPO for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %573,/his/her/your/ opinion.
How %575,/would he/she/do you/ rate OC TRANSPO for ...
Being available when you need it ?

.....	9	7%	121
.....	11	9%	
.....	5	4%	
.....	1	1%	
.....	12	10%	
.....	5	4%	
.....	6	5%	
.....	4	3%	
.....	4	3%	
.....	3	2%	
DON'T KNOW/NOT APPLICABLE	61	50%	

Q16. I would like you to rate OC TRANSPO for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %577,/his/her/your/ opinion.
How %579,/would he/she/do you/ rate OC TRANSPO for ...
For getting you where you want to go on time ?

.....			
.....	5	4%	121
.....	12	10%	
.....	6	5%	
.....	1	1%	
.....	11	9%	
.....	7	6%	
.....	4	3%	
.....	6	5%	
.....	0	0%	
.....	4	3%	
DON'T KNOW/NOT APPLICABLE	65	54%	

Q16. I would like you to rate OC TRANSPO for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %581,/his/her/your/ opinion.
How %583,/would he/she/do you/ rate OC TRANSPO for ...
Being a satisfactory method of transportation for you ?

.....			
.....	28	23%	121
.....	12	10%	
.....	4	3%	
.....	3	2%	
.....	4	3%	
.....	6	5%	
.....	3	2%	
.....	5	4%	
.....	0	0%	
.....	4	3%	
DON'T KNOW/NOT APPLICABLE	52	43%	

Q16. Firstly, I would like you to rate PARA TRANSPO SERVIVE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %585,/his/her/your/ opinion.
How %587,/would he/she/do you/ rate PARA TRANSPO SERVICE for ...
Being comfortable for you to ride in ?

.....			
.....	2	2%	121
.....	0	0%	
.....	3	2%	
.....	3	2%	
.....	13	11%	
.....	4	3%	
.....	5	4%	
.....	25	21%	
.....	12	10%	
.....	24	20%	
DON'T KNOW/NOT APPLICABLE	30	25%	

Q16. Firstly, I would like you to rate PARA TRANSPO SERVIVE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %589,/his/her/your/ opinion.
How %591,/would he/she/do you/ rate PARA TRANSPO SERVICE for ...
Being physically easy for you to get into and out of ?

.....			
.....	3	2%	121
.....	0	0%	
.....	1	1%	
.....	0	0%	
.....	3	2%	
.....	5	4%	
.....	3	2%	
.....	20	17%	
.....	14	12%	
.....	41	34%	
DON'T KNOW/NOT APPLICABLE	31	26%	

Q16. Firstly, I would like you to rate PARA TRANSPO SERVIVE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %593,/his/her/your/ opinion. How %595,/would he/she/do you/ rate PARA TRANSPO SERVICE for ...
Being affordable for you ?

.....	1	1%	121
.....	2	2%	
.....	1	1%	
.....	1	1%	
.....	7	6%	
.....	6	5%	
.....	5	4%	
.....	24	20%	
.....	7	6%	
.....	35	29%	
DON'T KNOW/NOT APPLICABLE	32	26%	

Q16. Firstly, I would like you to rate PARA TRANSPO SERVIVE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %597,/his/her/your/ opinion. How %599,/would he/she/do you/ rate PARA TRANSPO SERVICE for ...
Providing you with any assistance you require getting into and out of the vehicle ?

.....	5	4%	121
.....	0	0%	
.....	0	0%	
.....	0	0%	
.....	2	2%	
.....	3	2%	
.....	2	2%	
.....	22	18%	
.....	12	10%	
.....	49	40%	
DON'T KNOW/NOT APPLICABLE	26	21%	

Q16. Firstly, I would like you to rate PARA TRANSPO SERVIVE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %601,/his/her/your/ opinion. How %603,/would he/she/do you/ rate PARA TRANSPO SERVICE for ...
Being available when you need it ?

.....	5	4%	121
.....	5	4%	
.....	4	3%	
.....	1	1%	
.....	9	7%	
.....	10	8%	
.....	11	9%	
.....	26	21%	
.....	8	7%	
.....	15	12%	
DON'T KNOW/NOT APPLICABLE	27	22%	

Q16. Firstly, I would like you to rate PARA TRANSPO SERVIVE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %605,/his/her/your/ opinion. How %607,/would he/she/do you/ rate PARA TRANSPO SERVICE for ...
For getting you where you want to go on time ?

.....	3	2%	121
.....	1	1%	
.....	6	5%	
.....	2	2%	
.....	15	12%	
.....	4	3%	
.....	10	8%	
.....	20	17%	
.....	14	12%	
.....	17	14%	
DON'T KNOW/NOT APPLICABLE	29	24%	

Q16. Firstly, I would like you to rate PARA TRANSPO SERVIVE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %609,/his/her/your/ opinion. How %611,/would he/she/do you/ rate PARA TRANSPO SERVICE for ...
Being a satisfactory method of transportation for you ?

.....	8	7%	121
.....	0	0%	
.....	2	2%	
.....	4	3%	
.....	8	7%	
.....	9	7%	
.....	4	3%	
.....	19	16%	
.....	11	9%	
.....	29	24%	
DON'T KNOW/NOT APPLICABLE	27	22%	

Q16.Firstly, I would like you to rate REGULAR TAXI SERVICE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %613,/his/her/your/ opinion. How %615,/would he/she/do you/ rate REGULAR TAXI SERVICE for ...
Being comfortable for you to ride in ?

.....	9	7%	121
.....	5	4%	
.....	4	3%	
.....	7	6%	
.....	16	13%	
.....	11	9%	
.....	9	7%	
.....	13	11%	
.....	5	4%	
.....	17	14%	
DON'T KNOW/NOT APPLICABLE	25	21%	

Q16.Firstly, I would like you to rate REGULAR TAXI SERVICE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %617,/his/her/your/ opinion. How %619,/would he/she/do you/ rate REGULAR TAXI SERVICE for ...
Being physically easy for you to get into and out of ?

.....	15	12%	121
.....	8	7%	
.....	6	5%	
.....	8	7%	
.....	18	15%	
.....	7	6%	
.....	6	5%	
.....	17	14%	
.....	3	2%	
.....	9	7%	
DON'T KNOW/NOT APPLICABLE	24	20%	

Q16.Firstly, I would like you to rate REGULAR TAXI SERVICE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %621,/his/her/your/ opinion. How %623,/would he/she/do you/ rate REGULAR TAXI SERVICE for ...
Being affordable for you ?

.....	24	20%	121
.....	11	9%	
.....	12	10%	
.....	11	9%	
.....	15	12%	
.....	5	4%	
.....	2	2%	
.....	4	3%	
.....	0	0%	
.....	6	5%	
DON'T KNOW/NOT APPLICABLE	31	26%	

Q16.Firstly, I would like you to rate REGULAR TAXI SERVICE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %625,/his/her/your/ opinion. How %627,/would he/she/do you/ rate REGULAR TAXI SERVICE for ...
Providing you with any assistance you require getting into and out of the vehicle ?

.....	23	19%	121
.....	10	8%	
.....	11	9%	
.....	7	6%	
.....	18	15%	
.....	7	6%	
.....	4	3%	
.....	4	3%	
.....	6	5%	
.....	3	2%	
DON'T KNOW/NOT APPLICABLE	28	23%	

Q16.Firstly, I would like you to rate REGULAR TAXI SERVICE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %629,/his/her/your/ opinion. How %631,/would he/she/do you/ rate REGULAR TAXI SERVICE for ...
Being available when you need it ?

.....	7	6%	121
.....	2	2%	
.....	4	3%	
.....	3	2%	
.....	17	14%	
.....	10	8%	
.....	7	6%	
.....	11	9%	
.....	9	7%	
.....	21	17%	
DON'T KNOW/NOT APPLICABLE	30	25%	

Q16.Firstly, I would like you to rate REGULAR TAXI SERVICE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %633,/his/her/your/ opinion. How %635,/would he/she/do you/ rate REGULAR TAXI SERVICE for ...
For getting you where you want to go on time ?

.....	6	5%	121
.....	1	1%	
.....	2	2%	
.....	1	1%	
.....	14	12%	
.....	12	10%	
.....	7	6%	
.....	13	11%	
.....	8	7%	
.....	19	16%	
DON'T KNOW/NOT APPLICABLE	38	31%	

Q16.Firstly, I would like you to rate REGULAR TAXI SERVICE for a number of attributes on a scale from "1" to "10". In each case, "10" is the highest score you can give and "1" is the lowest. You can give any score from "1" to "10", depending on %637,/his/her/your/ opinion. How %639,/would he/she/do you/ rate REGULAR TAXI SERVICE for ...
Being a satisfactory method of transportation for you ?

.....	15	12%	121
.....	13	11%	
.....	7	6%	
.....	7	6%	
.....	14	12%	
.....	9	7%	
.....	6	5%	
.....	8	7%	
.....	1	1%	
.....	13	11%	
DON'T KNOW/NOT APPLICABLE	28	23%	

(VERSION) %N PLEASE ENTER NUMBER ON TOP OF LIST

1.....	32	26%	121

2.....	26	21%
3.....	29	24%
4.....	34	28%

ALL RESPONDENTS

MASKING ALL YES'S FROM Q17 MACRO

I cannot afford to travel as much as I would like..	37	26%	141
I have trouble getting in and out of most vehicles.	78	55%	
I am not eligible for Para Transpo.....	16	11%	
I have trouble getting transportation when I require it.....	37	26%	
I cannot travel alone....	49	35%	
I do not like travelling in the community.....	14	10%	
Is there anything else that restricts travel....	18	13%	
OTHER.....	0	0%	
9.....	0	0%	
10.....	0	0%	
11.....	0	0%	
12.....	0	0%	
13.....	0	0%	
14.....	0	0%	
15.....	0	0%	
16.....	0	0%	
17.....	0	0%	
18.....	0	0%	
19.....	0	0%	
DON'T KNOW.....	0	0%	
OPEN.....	0	0%	

Q17. As you know, some disabled people are more restricted than others in their ability to get around in their community. Which of the following circumstances, if any, have made it difficult for %647,/him/her/you / to travel around in the Ottawa area?

I cannot afford to travel as much as I would like .

YES.....	37	26%	144
NO.....	106	74%	
DON'T KNOW.....	1	1%	

I have trouble getting in and out of most vehicles .

YES.....	80	56%	144
NO.....	61	42%	
DON'T KNOW.....	3	2%	

I am not eligible for Para Transpo .

YES.....	17	12%	144
NO.....	116	81%	
DON'T KNOW.....	11	8%	

I have trouble getting transportation when I require it .

YES.....	38	26%	144
NO.....	104	72%	
DON'T KNOW.....	2	1%	

I cannot travel alone .

YES.....	50	35%	144
NO.....	91	63%	
DON'T KNOW.....	3	2%	

I do not like travelling in the community .

YES.....	15	10%	144
NO.....	127	88%	
DON'T KNOW.....	2	1%	

Is there any other thing the restricts travel .

YES.....	19	13%	144
NO.....	122	85%	
DON'T KNOW.....	3	2%	

Q17B What else is there that would restrict travel

1.....	0	0%	19
2.....	0	0%	
3.....	0	0%	
4.....	0	0%	

5	0	0%
6	0	0%
7	0	0%
8	0	0%
9	0	0%
10	0	0%
11	0	0%
12	0	0%
13	0	0%
14	0	0%
15	0	0%
16	0	0%
17	0	0%
18	1	5%
OTHER	18	95%
DON'T KNOW	0	0%
OPEN	0	0%

Q18. Which of these circumstances has most often restricted %671,/his/her/your / ability to get around in the community? READ LIST IF NECESSARY

I cannot afford to travel as much as I would like	13	16%	83
I have trouble getting in and out of most vehicles	32	39%	
I am not eligible for Para Transpo	1	1%	
I have trouble getting transportation when I require it	11	13%	
I cannot travel alone	23	28%	
I do not like travelling in the community	1	1%	
Is there anything else that restricts travel	1	1%	
OTHER	0	0%	
9	0	0%	
10	0	0%	
11	0	0%	
12	0	0%	
13	0	0%	
14	0	0%	
15	0	0%	
16	0	0%	
17	0	0%	
18	0	0%	
19	0	0%	
DON'T KNOW	8	10%	
OPEN	0	0%	

Transport Canada and the Ontario Ministry of Transportation are sponsoring a special test of a new transportation service available to people in the Ottawa area. The service is known as the Assessible Taxi Service. The service will use mini- vans that can accommodate wheelchair passengers and passengers with other mobility problems. The mini-vans will be operated by Blue Line Taxi on the same basis as a regular taxi service, at regular taxi prices. The drivers will be trained to provide assistance, where needed.

Q19. How likely is it that %677,/he/she/you/ would use the Accessible Taxi Service. Would you say you...?

Definitely would use it	31	22%	144
Probably would use it	34	24%	
Might or might not use it	39	27%	
Probably would not use it	22	15%	
Definitely would not use it	18	13%	

Q20. Based on the description I have just read, what %679,/does he/she/do you/ particularly like about, or consider to be an advantage of, the Accessible Taxi Service?

AVAILABILITY/ANYTIME/DAY OR NIGHT/ON DEMAND/WHEN I NEED IT/CAN PHONE AT LAST MINUTE	32	22%	144
FOR EMERGENCIES/IN CASE OF.../IF I HAVE TO RUSH TIO THE HOSPITAL	6	4%	
SOUNDS CONVENIENT/MORE CONVENIENT	13	9%	
MORE FREEDOM/CAN STAY PAST MIDNIGHT/NO MORE DEADLINE	15	10%	

NO BOOKING IN ADVANCE/24 HR./DAY NOTICE AHEAD.....	22	15%
ASSISTANCE/HELP TO GET IN AND OUT/DRIVER/SOMEONE TO ASSIST YOU/TRAINED.....	21	15%
FASTER/FAST SERVICE/NO WAIT.....	9	6%
GOOD IDEA/GREAT/FINE.....	13	9%
EASY SERVICE/TO GET AROUND/TO GET OUT.....	19	13%
MORE COMFORTABLE/NOT HAVING TO GET IN - OUT OF WHEELCHAIR.....	7	5%
TO GET THERE IN TIME/EFFICIENT.....	7	5%
WOULD TRY THEM/WOULD TRY TO SEE/IF I HAVE THE OCCASION.....	5	3%
NOTHING.....	10	7%
MISCELLANEOUS.....	16	11%
15.....	0	0%
16.....	0	0%
17.....	0	0%
18.....	0	0%
19.....	0	0%
20.....	0	0%
21.....	0	0%
22.....	0	0%
23.....	0	0%
24.....	0	0%
25.....	0	0%
26.....	0	0%
27.....	0	0%
28.....	0	0%
29.....	0	0%
DON'T KNOW.....	14	10%
OPEN.....	0	0%

Q21. What is it that %684,/he/she dislikes/you dislike / about, or consider to be a disadvantage of, this new transportation service?

PRICE/COST (UNSPECIFIED).	37	26%	144
TOO EXPENSIVE/TOO COSTLY/MORE EXPENSIVE/PRICE IS HIGH/REGULAR TAXI FARES (TOO HIGH)/MORE EXPENSIVE THAN PARA TRANSPORT.....	23	16%	
CANNOT AFFORT IT ON DISABILITY/PENSION/FIXED INCOME.....	3	2%	
THE WAITING/FROM SOMEWHERE ELSE, MIGHT BE A PROBLEM/NOT GOING TO BE AVAILABLE WHEN YOU NEED/LONG TIME TO GET THEM ON ROAD.....	3	2%	
NEW SERVICE SHOULD BE FROM PARA TRANSPORT/THEY DON'T WANT TO UPGRADE PARA SO NEW CAB SERVICE..	3	2%	
MENTAL DISORDERS NEED SOMEONE WELL VERSED/WHO CAN HANDLE.....	4	3%	
NONE/NOTHING/NOT REALLY..	37	26%	
8.....	0	0%	
9.....	0	0%	
10.....	0	0%	
11.....	0	0%	
12.....	0	0%	
13.....	0	0%	
14.....	0	0%	
15.....	0	0%	
16.....	0	0%	
17.....	0	0%	
18.....	0	0%	
19.....	0	0%	
20.....	0	0%	
21.....	0	0%	
22.....	0	0%	
23.....	0	0%	
24.....	0	0%	
25.....	0	0%	
26.....	0	0%	
27.....	0	0%	
28.....	0	0%	
MISCELLANEOUS.....	15	10%	

DON'T KNOW..... 28 19%

OPEN..... 0 0%

+----------+
| IF Q19 DEFINITELY/PROBABLY WOULD USE |
+----------+

Q22. Do you think the trips %691,/he/she/you/ would take using the Accessible Taxi Service would be in addition to those currently taken, or would the Accessible Taxi trips replace some or all of the current trips taken using other travel methods?
READ LIST

Would be in addition to current trips..... 34 52% 65

Would replace some current trips..... 26 40%

Would replace most current trips..... 4 6%

Would replace all current trips..... 1 2%

Q23. RECORD SEX WITHOUT ASKING

MALE..... 53 37% 144

FEMALE..... 91 63%

Q24. %693,/Was he/she/Were you / employed during the past month?

YES..... 34 24% 144

NO..... 110 76%

REFUSED..... 0 0%

+----------+
| IF Q24A YES |
+----------+

Q24B Was that...READ LIST

FULL-TIME..... 29 85% 34

PART-TIME..... 5 15%

+----------+
| IF Q24A NO |
+----------+

Q24C %699,/Is he/she/Are you/ ... READ LIST

A HOMEMAKER..... 13 12% 110

RETIRED..... 59 54%

A STUDENT..... 8 7%

UNEMPLOYED/LAID OFF..... 30 27%

Q25. What is %701,/his/her/your/ age?

UNDER 18..... 0 0% 144

18-39..... 42 29%

40-64..... 49 34%

65 AND OVER..... 49 34%

REFUSED..... 4 3%

Q26. We plan to recruit a number of trial riders to help us evaluate the Accessible Taxi Service. %703,/His/Her/Your/ participation would entail keeping a diary, for a one month period, describing each trip outside the house. We will provide an incentive payment of $20 per week to trial riders. Would %705,/he/she/you/ be willing to act as a trial rider.

YES..... 72 50% 144

NO..... 72 50%

(NAME) Would you please give me your full name and address including apartment and postal code?
TYPE NAME ONLY BELOW.

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

Type Street Number And Street Name ONLY.

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

APARTMENT OR ROOM/SUITE NUMBER
PRESS RETURN AND LEAVE BLANK IF NOT APPLICABLE

+-+-+-+-+-+-+-+-+-+-+

POSTAL CODE OR ZIP CODE.
NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+

And if I may just verify your address now:

NAME: %109.
STREET: %110. @%111.
POST CODE: %112.

REDO NAME..... 0 0% 72

REDO STREET..... 0 0%

REDO APT/SUITE..... 0 0%

REDO POSTAL CODE..... 0 0%

NO MORE CORRECTIONS..... 72100%

```
+----------------------------------------+
| You stated earlier that there are      |
| other disabled adults living in this   |
| household. Could you please give me    |
| their name(s) and                      |
| phone number(s) if different           |
|                                        |
| As we would like to get their opinion  |
| as well                                |
+----------------------------------------+


%n
ENTER NAME OF OTHER DISABLED ADULT IN
HOUSEHOLD

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+


%n
ENTER PHONE NUMBER OF OTHER DISABLED
ADULT IN HOUSEHOLD

DO NOT ENTER AREA CODE

IF SAME ENTER THIS NUMBER %2.

  +---+---+---+---+---+---+---+


Just To Verify.....READ
NAME                %114.
TELEPHONE NUMBER    %115.

  REDO NAME.................   0  0%  22

  REDO TELEPHONE NUMBER....   0  0%

  CONTINUE INTERVIEW.......  22100%

%N: PROBE:
Is there anyone else ?

  YES.......................   2  9%  22

  NO........................  20 91%

%n
ENTER NAME OF OTHER DISABLED ADULT IN
HOUSEHOLD

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

%n
ENTER PHONE NUMBER OF OTHER DISABLED
ADULT IN HOUSEHOLD

DO NOT ENTER AREA CODE

IF SAME ENTER THIS NUMBER %2.

  +---+---+---+---+---+---+---+

Just To Verify.....READ
NAME                %118.
TELEPHONE NUMBER    %119.

  REDO NAME.................   0  0%   2

  REDO TELEPHONE NUMBER....   0  0%

  CONTINUE INTERVIEW.......  2100%

%N: PROBE:
Is there anyone else ?

  YES.......................   0  0%   2

  NO........................  2100%

%n
ENTER NAME OF OTHER DISABLED ADULT IN
HOUSEHOLD

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

%n
ENTER PHONE NUMBER OF OTHER DISABLED
ADULT IN HOUSEHOLD

DO NOT ENTER AREA CODE

IF SAME ENTER THIS NUMBER %2.

  +---+---+---+---+---+---+---+

Just To Verify.....READ
NAME                %122.
TELEPHONE NUMBER    %123.

  REDO NAME.................   0   -   0

  REDO TELEPHONE NUMBER....   0   -

  CONTINUE INTERVIEW.......   0   -

%N: PROBE:
Is there anyone else ?

  YES.......................   0   -   0

  NO........................   0   -

%n
ENTER NAME OF OTHER DISABLED ADULT IN
HOUSEHOLD

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

%n
ENTER PHONE NUMBER OF OTHER DISABLED
ADULT IN HOUSEHOLD

DO NOT ENTER AREA CODE

IF SAME ENTER THIS NUMBER %2.

  +---+---+---+---+---+---+---+

Just To Verify.....READ
NAME                %126.
TELEPHONE NUMBER    %127.

  REDO NAME.................   0   -   0

  REDO TELEPHONE NUMBER....   0   -

  CONTINUE INTERVIEW.......   0   -

%N: PROBE:
Is there anyone else ?

  YES.......................   0   -   0

  NO........................   0   -
```

%n
ENTER NAME OF OTHER DISABLED ADULT IN HOUSEHOLD

+-+-+-+-+-+-+-+-+-+-+-+-+

%n
ENTER PHONE NUMBER OF OTHER DISABLED ADULT IN HOUSEHOLD

DO NOT ENTER AREA CODE

IF SAME ENTER THIS NUMBER %2.

+--+--+--+--+--+--+--+

Just To Verify.....READ
NAME %130.
TELEPHONE NUMBER %131.

REDO NAME..... 0 - 0

REDO TELEPHONE NUMBER.... 0 -

CONTINUE INTERVIEW..... 0 -

%N: PROBE:
Is there anyone else ?

YES..... 0 - 0

NO..... 0 -

%n
ENTER NAME OF OTHER DISABLED ADULT IN HOUSEHOLD

+-+-+-+-+-+-+-+-+-+-+-+-+

%n
ENTER PHONE NUMBER OF OTHER DISABLED ADULT IN HOUSEHOLD

DO NOT ENTER AREA CODE

IF SAME ENTER THIS NUMBER %2.

+--+--+--+--+--+--+--+

Just To Verify.....READ
NAME %134.
TELEPHONE NUMBER %135.

REDO NAME..... 0 - 0

REDO TELEPHONE NUMBER.... 0 -

CONTINUE INTERVIEW..... 0 -

%N: PROBE:
Is there anyone else ?

YES..... 0 - 0

NO..... 0 -

Q27. Could you provide us with the names of other disabled persons in Ottawa who might be willing to respond to this questionnaire?

YES..... 21 15% 144

NO..... 123 85%

(NAME) Would you please give me their full name and address including apartment and postal code?

TYPE NAME ONLY BELOW.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+

Type Street Number And Street Name ONLY.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+

APARTMENT OR ROOM/SUITE NUMBER

PRESS RETURN AND LEAVE BLANK IF NOT APPLICABLE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+

Type HOME Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+

Type BUSINESS Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE OR NO BUSINESS, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+

POSTAL CODE OR ZIP CODE.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+

And if I may just verify their name and address now:

NAME: %139.
STREET: %140.
ROOM/APT NO. %141.
TELEPHONE NO.(HOME) %142.
TELEPHONE NO.(WORK) %143.
POST CODE: %144.

REDO NAME.....	0	0%	21
REDO STREET.....	0	0%	
REDO APT/SUITE.....	0	0%	
REDO TELEPHONE NO. (HOME)	0	0%	
REDO TELEPHONE NO. (WORK)	0	0%	
REDO POSTAL CODE.....	0	0%	
NO MORE CORRECTIONS.....	21	100%	

Is there anyone else ?

RECORD UP TO 5 NAMES

YES.....	6	29%	21
NO.....	15	71%	

(NAME) Would you please give me their full name and address including apartment and postal code?

TYPE NAME ONLY BELOW.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

Type Street Number And Street Name ONLY.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

APARTMENT OR ROOM/SUITE NUMBER

PRESS RETURN AND LEAVE BLANK IF NOT APPLICABLE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

Type HOME Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+

Type BUSINESS Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE OR NO BUSINESS, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+

POSTAL CODE OR ZIP CODE.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+

And if I may just verify their name and address now:

NAME: %147.
STREET: %148.
ROOM/APT NO. %149.
TELEPHONE NO.(HOME) %150.
TELEPHONE NO.(WORK) %151.
POST CODE: %152.

REDO NAME.....	0	0%	6
REDO STREET.....	0	0%	
REDO APT/SUITE.....	0	0%	
REDO TELEPHONE NO. (HOME)	0	0%	
REDO TELEPHONE NO. (WORK)	0	0%	
REDO POSTAL CODE.....	0	0%	
NO MORE CORRECTIONS.....	6	100%	

Is there anyone else ?

RECORD UP TO 5 NAMES

YES.....	2	33%	6
NO.....	4	67%	

(NAME) Would you please give me their full name and address including apartment and postal code?

TYPE NAME ONLY BELOW.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

Type Street Number And Street Name ONLY.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

APARTMENT OR ROOM/SUITE NUMBER

PRESS RETURN AND LEAVE BLANK IF NOT APPLICABLE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+

Type HOME Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+

Type BUSINESS Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE OR NO BUSINESS, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+

POSTAL CODE OR ZIP CODE.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+

And if I may just verify their name and address now:

NAME:	%155.
STREET:	%156.
ROOM/APT NO.	%157.
TELEPHONE NO.(HOME)	%158.
TELEPHONE NO.(WORK)	%159.
POST CODE:	%160.

REDO NAME.....	0	0%	2
REDO STREET.....	0	0%	
REDO APT/SUITE.....	0	0%	
REDO TELEPHONE NO. (HOME)	0	0%	
REDO TELEPHONE NO. (WORK)	0	0%	
REDO POSTAL CODE.....	0	0%	
NO MORE CORRECTIONS.....	2100%		

Is there anyone else ?

RECORD UP TO 5 NAMES

YES.....	1	50%	2
NO.....	1	50%	

(NAME) Would you please give me their full name and address including apartment and postal code?

TYPE NAME ONLY BELOW.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

Type Street Number And Street Name ONLY.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

APARTMENT OR ROOM/SUITE NUMBER

PRESS RETURN AND LEAVE BLANK IF NOT APPLICABLE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+

Type HOME Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+--+

Type BUSINESS Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE OR NO BUSINESS, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+--+

POSTAL CODE OR ZIP CODE.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+

And if I may just verify their name and address now:

NAME:	%163.
STREET:	%164.
ROOM/APT NO.	%165.
TELEPHONE NO.(HOME)	%166.
TELEPHONE NO.(WORK)	%167.
POST CODE:	%168.

REDO NAME.....	0	0%	1
REDO STREET.....	0	0%	
REDO APT/SUITE.....	0	0%	
REDO TELEPHONE NO. (HOME)	0	0%	
REDO TELEPHONE NO. (WORK)	0	0%	
REDO POSTAL CODE.....	0	0%	
NO MORE CORRECTIONS.....	1100%		

Is there anyone else ?

RECORD UP TO 5 NAMES

YES.....	1100%		1
NO.....	0	0%	

(NAME) Would you please give me their full name and address including apartment and postal code?

TYPE NAME ONLY BELOW.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

Type Street Number And Street Name ONLY.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+-+-+-+

APARTMENT OR ROOM/SUITE NUMBER

PRESS RETURN AND LEAVE BLANK IF NOT APPLICABLE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+-+-+-+-+-+-+-+-+-+-+

Type HOME Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+--+

Type BUSINESS Telephone Number ONLY.

DO NOT ENTER AREA CODE

NOTE: IF RESPONDENT UNSURE OR NO BUSINESS, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+--+--+--+

POSTAL CODE OR ZIP CODE.

NOTE: IF RESPONDENT UNSURE, PRESS RETURN AND LEAVE BLANK.

+--+--+--+--+--+--+--+

And if I may just verify their name and address now:

NAME: %171.
STREET: %172.
ROOM/APT NO. %173.
TELEPHONE NO.(HOME) %174.
TELEPHONE NO.(WORK) %175.
POST CODE: %176.

REDO NAME.....	0	0%	1
REDO STREET.....	0	0%	
REDO APT/SUITE.....	0	0%	
REDO TELEPHONE NO. (HOME)	0	0%	
REDO TELEPHONE NO. (WORK)	0	0%	
REDO POSTAL CODE.....	0	0%	
NO MORE CORRECTIONS.....	1100%		

Is there anyone else ?

RECORD UP TO 5 NAMES

YES.....	0	-	0
NO.....	0	-	

Thank you for your time. Goodbye.

Length of Interview

+--+--+--+ 144 19

IF GIVING NAMES OF PEOPLE IN OTTAWA

%N:
THIS IS THE TIME TO FILL IN ANY MISSING INFORMATION WHICH WAS LEFT OUT DURING THE INTERVIEW

DO YOU HAVE TO LOOK UP ANY INFORMATION SUCH AS

TELEPHONE NO. OR ADDRESS ETC. ?

YES.....	6	29%	21
NO.....	15	71%	

%N

This the name, address and phone number of the FIRST referral we obtained.

NAME: %139.
ADDRESS: %140.
ROOM/APT. NO.: %141.
TELEPHONE NO.(HOME): %142.
TELEPHONE NO.(WORK): %143.
POSTAL CODE: %144.

REDO NAME.....	0	0%	6
REDO ADDRESS.....	0	0%	
REDO ROOM/APT. NO.....	0	0%	
REDO TELEPHONE NO. (HOME)	0	0%	
REDO TELEPHONE NO. (WORK)	0	0%	
REDO POSTAL CODE.....	0	0%	
OK ALL INFO OBTAINED.....	6100%		

%N

This the name, address and phone number of the SECOND referral we obtained.

NAME: %147.
ADDRESS: %148.
ROOM/APT. NO.: %149.
TELEPHONE NO.(HOME): %150.
TELEPHONE NO.(WORK): %151.
POSTAL CODE: %152.

REDO NAME.....	0	0%	1
REDO ADDRESS.....	0	0%	
REDO ROOM/APT. NO.....	0	0%	
REDO TELEPHONE NO. (HOME)	0	0%	
REDO TELEPHONE NO. (WORK)	0	0%	
REDO POSTAL CODE.....	0	0%	
OK ALL INFO OBTAINED.....	1100%		

%N

This the name, address and phone number of the THIRD referral we obtained.

NAME: %155.
ADDRESS: %156.
ROOM/APT. NO.: %157.
TELEPHONE NO.(HOME): %158.
TELEPHONE NO.(WORK): %159.
POSTAL CODE: %160.

REDO NAME.....	0	-	0
REDO ADDRESS.....	0	-	
REDO ROOM/APT. NO.....	0	-	
REDO TELEPHONE NO. (HOME)	0	-	
REDO TELEPHONE NO. (WORK)	0	-	
REDO POSTAL CODE.....	0	-	
OK ALL INFO OBTAINED.....	0	-	

%N

This the name, address and phone number of the FOURTH referral we obtained.

NAME: %163.
ADDRESS: %164.
ROOM/APT. NO.: %165.
TELEPHONE NO.(HOME): %166.
TELEPHONE NO.(WORK): %167.
POSTAL CODE: %168.

REDO NAME.....	0	-	0
REDO ADDRESS.....	0	-	
REDO ROOM/APT. NO.....	0	-	
REDO TELEPHONE NO. (HOME)	0	-	
REDO TELEPHONE NO. (WORK)	0	-	
REDO POSTAL CODE.....	0	-	
OK ALL INFO OBTAINED.....	0	-	

%N

This the name, address and phone number of the FIFTH referral we obtained.

NAME: %171.
ADDRESS: %172.
ROOM/APT. NO.: %173.
TELEPHONE NO.(HOME): %174.
TELEPHONE NO.(WORK): %175.
POSTAL CODE: %176.

REDO NAME.....	0	-	0
REDO ADDRESS.....	0	-	
REDO ROOM/APT. NO.....	0	-	
REDO TELEPHONE NO. (HOME)	0	-	
REDO TELEPHONE NO. (WORK)	0	-	
REDO POSTAL CODE.....	0	-	
OK ALL INFO OBTAINED.....	0	-	

%N:

Do you want to check them one more time ?

This is definitely your LAST chance.

YES.....	0	0%	6
NO - ALL INFORMATION COLLECTED.....	6	100%	

IS THIS A COMPLETION?

YES.....	128	89%	144
YES BUT HAD A PROBLEM....	16	11%	

PLEASE EXPLAIN.

1.....	0	0%	16
2.....	0	0%	
3.....	0	0%	
4.....	0	0%	
5.....	0	0%	
6.....	0	0%	
7.....	0	0%	
8.....	0	0%	
9.....	0	0%	
10.....	0	0%	
11.....	0	0%	
12.....	0	0%	
13.....	0	0%	
14.....	0	0%	
15.....	0	0%	
16.....	0	0%	
17.....	0	0%	
18.....	0	0%	
19.....	0	0%	
20.....	0	0%	

APPENDIX C

TIMING ON ENTERING AND EXITING ACCESSIBLE TAXIS

Passenger 1

Manual Wheelchair
Width = 74 cm. (39"), Length = 102 cm. (40")

A-1 Taxi (Raised-roof Vehicle) Rear Left Position					
Ramp	Yes	Yes	Yes		
Trial	1	2	3	Average	
Loading					
Deploy Ramp	:11				
Enter Taxi	:22	:15	:14	:17	
Positioning	:08	:10	:09	:09	
Securement			4:02		
Unloading					
Release					
Manoeuvring	:08	:07		:08	
Exit Taxi	:10	:13	:12	:12	
Stow Ramp			1:13	1:13	
Blue-Line Taxi (Lower-floor Vehicle) Rear Left Position					
Ramp	No	No	No	Yes	
Trial	1	2	3	4	Average
Loading					
Deploy Ramp	-	-	-	:25	
Enter Taxi	:20	:19	:13	:14	:17
Positioning	:16		:15	:10	:14
Securement			3:48		
Unloading					
Release			:58		
Manoeuvring	:09		:17	:12	:13
Exit Taxi	:15	:14	:15	:11	:14
Stow Ramp	-	-	-	:40	

Passenger 2

Semi-Ambulatory

A-1 Taxi (Raised-roof Vehicle)				
Ramp	Yes	Yes	Yes	
Trial	1	2	3	Average
Loading				
Deploy Ramp	:24		:16	:20
Enter Taxi	:50	:46		:48
Unloading				
Exit Taxi	:55	:47		:51
Stow Ramp		:29	:42	:36
Blue-Line Taxi (Lowered-floor Vehicle)				
Ramp	No	Yes		
Trial	1	2	Average	
Loading				
Deploy Ramp	-	:45		
Enter Taxi	:55	:47	:51	
Unloading				
Exit Taxi	:34	:41	:38	

Passenger 3

Semi-Ambulatory

A-1 Taxi (Raised-roof Vehicle)			
Ramp	Yes	No	
Trial	1	2	Average
Loading			
Deploy Ramp	:16	-	
Enter Taxi	:14	:11	:13
Unloading			
Exit Taxi	:12	:09	:11
Stow Ramp	:16	-	
Blue-Line Taxi (Lowered-floor Vehicle)			
Ramp	No	Yes	
Trial	1	2	Average
Loading			
Deploy Ramp	-	:23	
Enter Taxi	:09	:14	:12
Unloading			
Exit Taxi	:09	:16	:13

Passenger 4

Electric Wheelchair (Invicair Arrow)
Width = 65 cm (26"), Length = 117 cm (46")

A-1 Taxi (Raised-roof Vehicle)	
Rear Right Position	
Ramp	Yes
Trial	1
Loading	
Deploy Ramp	:18
Enter Taxi	:09
Positioning	:59
Securement	2:38
Unloading	
Release	1:15
Manoeuvring	:07
Stow Ramp	:21

Blue Line Taxi (Lowered-floor Vehicle)		
Front Right Position (Front Seat Removed)		
Ramp	Yes	Yes
Trial	1	2
Loading		
Remove Seat		:30
Deploy Ramp	:35	-
Enter Taxi	:20	:16
Positioning		:09
Securement		2:25
Stow Seat		:18
Unloading		
Remove Seat		:14
Release		:59
Manoeuvring		:12
Exit Taxi	:09	:18
Replace Seat		:24

Passenger 5

Scooter (Braun)
Width = 64 cm (25"), Length = 97 cm (38")

A-1 Taxi (Raised-roof Vehicle)		
Right Position		
Ramp	Yes	Yes
Trial	1	2
Loading		
Deploy Ramp	:22	:19
Enter Taxi	:08	:07
Positioning		> 2:00 [1]
Securement		5:17 [2]
Unloading		
Release		:30
Deploy Ramp		:14
Manoeuvring		:26
Exit Taxi	:16	:10
Stow Ramp	:10	:11

Blue-Line Taxi (Lowered-floor Vehicle)	
Front Right Position (Front Seat Removed)	
Ramp	Yes
Trial	1
Loading	
Remove Seat	:15
Enter Taxi	:06
Positioning	:16
Securement	2:20 [2]
Stow Seat	:23
Stow Ramp	:10
Unloading	
Deploy Ramp	:13
Remove Seat	:12
Release	:41
Manoeuvring	:19
Exit Taxi	:10
Replace Seat	:20

---

[1] Ramp stowed and door closed
[2] No belts

Passenger 6

Manual Wheelchair
Width = 70 cm (28"), Length = 97 cm (38")

A-1 Taxi (Raised-roof Vehicle)
Right Left Position

Ramp	Yes	No
Trial	1	2
Loading		
Deploy Ramp	:19	-
Enter Taxi	:21	:16
Positioning	:09	:05
Securement	2:31	
Unloading		
Release	:45	
Manoeuvring	:09	:07
Exit Taxi	:07	:06
Stow Ramp	:15	

Blue-Line Taxi (Lowered-floor Vehicle)
Rear Left Position

Ramp	Yes
Trial	1
Loading	
Deploy Ramp	:22
Enter Taxi	:13
Positioning	:08
Securement	2:44
Unloading	
Release	:47
Manoeuvring	:10
Exit Taxi	:05

Passenger 7

Manual Wheelchair (Etac)
Width = 62 cm (24"), Length = 107 cm (42")

A-1 Taxi (Raised-roof Vehicle)
Right Position

Ramp	Yes	Yes
Trial	1	2
Loading		
Deploy Ramp	:21	
Enter Taxi	:07	:07
Positioning	:07	
Securement	2:20 [1]	
Unloading		
Release	:40	
Manoeuvring	:07	
Exit Taxi	:08	:08

Blue-Line Taxi (Lowered-floor Vehicle)
Rear Right Position

Ramp	No	No	No	Yes	
Trial	1	2	3	4	Average
Loading					
Deploy Ramp	-	-	-	:30	:30
Enter Taxi	:18	:08	:07	:10	:11
Positioning			:04		
Securement			2:37		
Unloading					
Exit Taxi	:09	:08		:07	:08

---

[1] No shoulder belt

APPENDIX D

TEST RIDER DIARY

TRIP DIARY

Your Trip Diary

Transport Canada and the Ontario Ministry of Transportation are sponsoring a demonstration of Accessible Taxis. You have agreed to be a trial rider. To help us evaluate the demonstration, we would like you to keep a personal travel diary of trips taken in the Ottawa area within a 50-mile (80 km) radius from your home.

The diary should be kept for a one-month period. Every trip taken during this period should be recorded in the diary, whether or not an Accessible Taxi is the selected mode of transportation. By travel we mean any trip you may have taken locally to shop, visit friends, see a doctor, go to work or school. These trips could be either as a passenger or a driver in either a private, commercial or public vehicle. One-way counts as one trip.

The diary is very easy to complete. Simply check off the answers which best express your opinion. We have completed an example for you. Complete one set of questions for each one-way trip taken during the month. If you have any trouble completing the diary, please call Ada Forsyth collect at (416) 924-7116.

Telephone No. for Accessible Taxi:

BLUE LINE: 238-1111
A1 TAXI: 746-1616

TRIP EXAMPLE

Trip No. _____ 17

1. **TIME OF DAY**

DATE: _____ , _____ , _____ _____ : _____ a.m./p.m. 18-19
DAY MONTH YEAR

2. **MAIN PURPOSE OF THE TRIP**
Destination:

20-1 ☐ Go to work
2 ☐ Other personal business (bank, etc.)
3 ☐ Shopping
4 ☐ Medical Facilities
5 ☐ Leisure/Recreational Facilities
6 ☐ Visit relatives, friends
7 ☐ School
8 ☐ Airport, Train Station, Bus Depot
9 ☐ Return home
☐ Other (including multi-purpose)
_____ 21

3. **MODE OF TRANSPORTATION USED**

22-1 ☐ Accessible Taxi (raised roof)
2 ☐ Accessible Taxi (lowered floor)
3 ☐ Ordinary taxi
4 ☐ Regular OC Transpo bus
5 ☐ Private vehicle, as a passenger
6 ☐ Private vehicle, as a driver
7 ☐ Para Transpo
☐ Other (Specify) _____ 23

4. **WHY DID YOU SELECT THIS PARTICULAR MODE OF TRANSPORTATION? (Check more than one box where appropriate)**

24-1 ☐ It was available (no one was using the car, the taxi was sitting idle, etc.)
2 ☐ I was curious. I wanted to try the Accessible Taxi.
3 ☐ The economic incentive provided meant I could afford the Accessible Taxi.
4 ☐ It was the most convenient alternative available at the time.
5 ☐ I didn't have to book in advance
6 ☐ I would usually use this type of transportation for a trip of this type.
7 ☐ There were no other alternatives available.
8 ☐ It is cheaper than the other options available to me.
☐ Other (Specify) _____ 25
_____ 26
_____

5. **PLEASE RATE THE FOLLOWING FEATURES OF THE SERVICE ON A SCALE OF 1 TO 10 OR NOT APPLICABLE (N/A).** In each case, "10" is the highest score you can give, and "1" is the lowest. You can give any score between "1" and "10", depending on your opinion. **How do you rate the Accessible Taxi in terms of:**

		Low									High	
Cleanliness and state of repair of vehicle	26.	1	2	3	4	5	6	7	8	9	10	N/A
Seating arrangement for passengers who use the vehicle's seat	27.	1	2	3	4	5	6	7	8	9	10	N/A
Smoothness of ride	28.	1	2	3	4	5	6	7	8	9	10	N/A
Politeness and courtesy of driver	29.	1	2	3	4	5	6	7	8	9	10	N/A
Overall safety of the vehicle	30.	1	2	3	4	5	6	7	8	9	10	N/A
Overall comfort of the vehicle	31.	1	2	3	4	5	6	7	8	9	10	N/A
Physically easy for you to get in and out	32.	1	2	3	4	5	6	7	8	9	10	N/A
Providing you with any assistance you require getting into and out of the vehicle	33.	1	2	3	4	5	6	7	8	9	10	N/A
Time taken to arrive after your call (if you called for the taxi)	34.	1	2	3	4	5	6	7	8	9	10	N/A
Affordability for you	35.	1	2	3	4	5	6	7	8	9	10	N/A
Wheelchair location during the trip	36.	1	2	3	4	5	6	7	8	9	10	N/A
Security of wheelchair/scooter tie-downs	37.	1	2	3	4	5	6	7	8	9	10	N/A
Steepness or slope of the ramp	38.	1	2	3	4	5	6	7	8	9	10	N/A
Room for passengers to manoeuvre in the vehicle	39.	1	2	3	4	5	6	7	8	9	10	N/A

IF YOU USED THE ACCESSIBLE TAXI, PLEASE FILL IN THE FOLLOWING SECTIONS:

6. DID ANYONE ACCOMPANY YOU ON THE TRIP?

40-1 ☐ Yes
2 ☐ No

41-1 ☐ Attendant
2 ☐ Other disabled rider(s) (Number: _____)
3 ☐ Other able-bodied rider(s) (Number: _____)

7. DID YOU REQUIRE ANY ASSISTANCE? (Check more than one where appropriate)

46-1 ☐ No assistance required
2 ☐ Assistance getting up/down the ramp
3 ☐ Assistance transferring to/from the seat
4 ☐ Assistance locating the wheelchair
5 ☐ Assistance fitting/releasing safety restraint
☐ Other (Specify) _____
_____

WHERE ASSISTANCE WAS PROVIDED, ESTIMATED TIME THE DRIVER SPENT ASSISTING YOU?

Into the vehicle _____ Minutes (Vehicle arrived until driver back in the seat)

Out of the vehicle _____ Minutes (Vehicle arrived until driver back in the seat)

8. SERVICE DETAILS FOR ACCESSIBLE TAXI

	Time of Day:	How did you travel during the trip?
Telephoned for taxi	____:____ a.m./p.m.	
Taxi arrived for pick-up	____:____ a.m./p.m.	88-1 ☐ In a wheelchair
Arrived at destination	____:____ a.m./p.m.	2 ☐ On the seat

9. WHEN DID THE DRIVER TURN THE METER ON/OFF?

89-1 ☐ The meter was on when I got into the vehicle
2 ☐ The meter was turned on when the vehicle started to move
3 ☐ The meter was turned off when we arrived at the destination
4 ☐ The meter was turned off after I left the vehicle

10. WOULD YOU HAVE MADE THE TRIP IF THE ACCESSIBLE TAXI HAD NOT BEEN AVAILABLE?

70-1 ☐ Yes 2 ☐ No

IF YES, WHAT ALTERNATIVE MODE OF TRANSPORTATION WOULD YOU HAVE USED?

71-1 ☐ Ordinary taxi
2 ☐ Para Transpo
3 ☐ Private vehicle, as a passenger
4 ☐ Private vehicle, as a driver
5 ☐ Regular OC Transpo buses
6 ☐ Walked or used wheelchair/scooter
☐ Other (Specify) _____ 72

11. WOULD THE TRIP HAVE BEEN DIFFERENT WITHOUT THE ACCESSIBLE TAXI?

73-1 ☐ Yes 2 ☐ No

IF YES, HOW WOULD THE TRIP HAVE BEEN DIFFERENT?

74-1 ☐ Would have taken longer to get to the destination
2 ☐ Would have been at a less convenient time
3 ☐ Would have forced me to revise my plans
☐ Other (Specify) _____ 75

12. WE WOULD APPRECIATE ANY OTHER REACTIONS OR COMMENTS YOU MAY WISH TO OFFER. (Where you have comments about a particular type of vehicle (raised roof vs lowered floor), please note which vehicle you are referring to.)

_____ 76
_____ 77
_____ 78
_____ 79
_____
_____
_____

Trip Diary Example

On June 5th, you arrange with Para Transpo to have them pick you up at home and drive you to work. You have a late afternoon meeting and cannot be ready for the Para Transpo pick-up at night. In addition, you plan to stay downtown and have dinner with a friend. Your friend drives you home after dinner.

Trip Number:	**01**
Date:	June 5, 1989
Time of Trip:	8:15 a.m.
Main Purpose of Trip:	Go to work
Mode of Transportation Used:	Para Transpo
Why did you select this particular mode of transportation?	I would usually use this type of transportation for a trip of this type. It is cheaper than the other options available to me.
Rate the Service:	...
Trip Number:	**02**
Date:	June 5, 1989
Time of Trip:	5:30 p.m.
Main Purpose of Trip:	Visit relatives/friends
Mode of Transportation Used:	Accessible Taxi (raised roof)
Why did you select this particular mode of transportation?	There were no other alternatives available. The economic incentive provided meant I could afford the Accessible Taxi.
Rate the Service:	...
Did anyone accompany you?	No
Did you require any assistance?	Assistance getting up the ramp/into the vehicle, locating the wheelchair, fitting the restraints, and getting out.
Estimated time Driver spent assisting you:	
Into the Taxi	5 minutes
Out of the Taxi	5 minutes
Service Details:	
Telephoned for Taxi:	5:15 p.m.
Taxi arrived for pick-up:	5:30 p.m.
Arrived at destination:	6:00 p.m.
How did you travel during the trip?	In a wheelchair
Meter turned:	
On	When the vehicle started to move
Off	When we arrived at the destination
Would you have made the trip if the Accessible Taxi had not been available?	Yes (but could not have stayed for the meeting or dinner). Would have forced me to revise my plans.
What alternative mode would you have used?	Para Transpo
How would the trip have been different?	Would have forced me to revise my plans (cancel my meeting, travel at a different time)

APPENDIX E

SELF-COMPLETED QUESTIONNAIRE

DEMONSTRATION OF ACCESSIBLE TAXIS

Transport Canada and the Ontario Ministry of Transportation are sponsoring a demonstration of Accessible Taxis. To help us evaluate the Accessible Taxis, please complete the following questionnaire. The questionnaire is easy to complete. Just check off the boxes which best express your opinion and leave the questionnaire in the box provided. We have left room for comments. You do not need to sign the questionnaire. If you require assistance or want to complete the questionnaire later, please obtain a stamped self-addressed envelope from the driver and drop it in the mail. Thank you for your help.

1. **DATE:** _____ _____ _____ (DAY MONTH YEAR) **TIME OF DAY** _____ a.m./p.m.

2. **HOW DID YOU COME TO USE THE ACCESSIBLE TAXI?**

- ☐ 1 Telephoned for Accessible Taxi
- ☐ 2 Telephoned for a taxi
- ☐ 3 Hailed it
- ☐ 4 Picked it up at taxi stand

3. **WOULD YOU HAVE MADE THE TRIP IF THIS TAXI HAD NOT BEEN AVAILABLE?**

- ☐ 1 Yes
- ☐ 2 No

If Yes, what mode of transportation would you have used?

- ☐ 1 Ordinary Taxi
- ☐ 2 Private vehicle, as a passenger
- ☐ 3 Private vehicle, as a driver
- ☐ 4 Regular OC Transpo buses
- ☐ 5 Walked
- ☐ 6 Para Transpo
- ☐ 7 Used wheelchair/scooter
- ☐ Other (Specify) _____

4. **HOW MANY TIMES HAVE YOU USED THE ACCESSIBLE TAXI? (Include this trip)**

- ☐ 1 Once
- ☐ 2 2 - 5 times
- ☐ 3 6 - 10 times
- ☐ 4 More than 10 times

5. **DID ANYONE ACCOMPANY YOU ON THE TRIP?**

- ☐ 1 Yes
- ☐ 2 No

- ☐ 1 Attendant
- ☐ 2 Other disabled rider(s) (Number _____)
- ☐ 3 Other able-bodied rider(s) (Number _____)

6. **HOW WOULD YOU CHARACTERIZE YOURSELF?**

- ☐ 1 Able-bodied
- ☐ 2 Wheelchair/Scooter User
- ☐ 3 Ambulatory (able to walk with the aid of a cane, walker, or crutches)

7. PLEASE RATE THE FOLLOWING FEATURES OF THE ACCESSIBLE TAXI SERVICE ON A SCALE OF 1 TO 10. In each case, "10" is the highest score you can give, and "1" is the lowest. You can give any score between "1" and "10", depending on your opinion. **For example:** If you were rating the colour of the car and you like blue cars, you might mark or circle "9".

ALL PASSENGERS:

How do you rate the Accessible Taxi service in terms of:

		Low									High	
Cleanliness and state of repair of vehicle	31	1	2	3	4	5	6	7	8	9	10	N/A
Seating arrangement for passengers who use the vehicle's seat	32	1	2	3	4	5	6	7	8	9	10	N/A
Smoothness of ride	33	1	2	3	4	5	6	7	8	9	10	N/A
Overall safety of the vehicle	34	1	2	3	4	5	6	7	8	9	10	N/A
Overall comfort of the vehicle	35	1	2	3	4	5	6	7	8	9	10	N/A

DISABLED PASSENGERS

How do you rate the Accessible Taxi service in terms of:

Physically easy for you to get in and out	36	1	2	3	4	5	6	7	8	9	10	N/A
Time taken to arrive after your call (if you called for the taxi)	37	1	2	3	4	5	6	7	8	9	10	N/A
Affordability for you	38	1	2	3	4	5	6	7	8	9	10	N/A
Wheelchair location during the trip	39	1	2	3	4	5	6	7	8	9	10	N/A
Security of wheelchair/scooter tie-downs	40	1	2	3	4	5	6	7	8	9	10	N/A
Steepness or slope of the ramp	41	1	2	3	4	5	6	7	8	9	10	N/A
Room for passengers to manoeuvre in the vehicle	42	1	2	3	4	5	6	7	8	9	10	N/A

8. WOULD YOU USE THE ACCESSIBLE TAXI SERVICE AGAIN?

43 ☐ Yes ☐ If No, why not? _____

2 ☐ No _____

9. WE WOULD APPRECIATE ANY OTHER REACTIONS OR COMMENTS YOU MAY WISH TO OFFER:

_____

_____

_____

APPENDIX F

DRIVER'S LOG

DATE:_____ REVISED ACCESSIBLE TAXI LOG CAR # SHEET #

Fare	Pick-up	Time		Drop-off	Time		Source			Passenger			Comments
		AM	PM		AM	PM	Dispatch	Street Stand	Pre-Book	Disabled		Non-disabled	
										Wheel-chair	Other		
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
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21													
22													
23													